

THE INDUSTRIALIST

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No. 1.

THE INDUSTRIALIST.

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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

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TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Probable Depression in Prices of Our Cereals.

The reports of the European harvest that have reached us by mail, are considerably more favorable than those just received by cable. According to the latter, the crops will be much shorter than reported some weeks ago, in northern Germany, Hungary, Galicia, and in many districts in Russia which have been ravaged by locusts and other insect pests. In the British Isles, however, the outlook is still very bright for abundant crops of almost every sort; and this favorable prospect is shared by France, Spain, and most of Italy. Although the trans-Atlantic harvest may, as a whole, not come up to the high expectations felt or published some time back, yet there is little or no doubt that it will be far better than last year's, and therefore that the demand for our cereals abroad will be considerably less than during the past season, unless at a material reduction of prices. Of course, there is just a possibility that severe storms or drought over a vast extent of country on either side of the Atlantic, may, even yet, very greatly reduce the supply in Europe or the surplus here; but this possibility is far from a probability.

Looking back at the reports of the very fine prospects for all European crops, that have, from time to time, been cabled across the Atlantic during the last few months, and comparing them with those received within the past week, one is apt to suspect that the glowing accounts of other days received some of their brightness from the desire of the Old World to lower the prices of the surplus cereals of the New, by embellishing the prospect of the abundant harvest that must soon generously relieve its own pressing need of foreign supplies. Be this as it may, enormous shipments of grain have lately been made to Europe, to anticipate the harvest there, and get all possible advantage from present rates. The arrival of these at their destination, together with the advent in market of the early harvest products of home growth, will doubtless still further depress prices, at least temporarily; and this depression is sure to influence figures here also. In view, therefore, of our splendid increase in crops here, and of the probable curtailment of the foreign demand for our surplus cereals, it is almost certain that prices will be unusually low, at any rate for the next few months.—*Rural New-Yorker*.

Morocco.

After a long conference at Madrid, the principal European Powers have for the first time succeeded in making a general convention with the Sultan of Morocco, resembling the Capitulations with the Porte, regulating the position and powers of the foreign consuls, and the rights, privileges and immunities of the foreigners and other persons protected by them and resident in Morocco. There is nothing in the Treaty sufficiently different from the Capitulations with the Porte, to call for remark. It is mainly noteworthy, as the first successful attempt to bring Morocco into close and formal relations with European Powers. The Sultan is now the most perfect specimen of the old Mahometan despot remaining. He has no ministers or cabinet, not even a vizir. His family has occupied the throne for three centuries; and he says he is a *sherif*, or descendant of the Prophet, which is doubtful, but for obvious reasons has never been disputed in Morocco. He claims the position of Caliph of the West, and assigns to the Turkish Sultan that of Caliph of the East only; and, as his subjects are almost all Mussulmans and the remainder Jews, he has a much happier time, from the Mussulman point of view, than his Turkish brother. His people are

ferociously fanatical, especially towards the Spaniards; but the country being very rich in natural resources, and the English, Spanish and French traders eager to get at it, and the security for foreigners hitherto very small, the establishment of consuls with regulated powers in the chief towns is an important matter. England has now most of the trade, and has the handling of a considerable portion of the customs and duties, as security for an advance made to pay the Spanish indemnity after the war of 1860. The Sultan's internal revenue has been estimated at \$3,000,000; but this is very doubtful, as there is no regular system of taxation. The usual plan of replenishing the treasury, is to lay hold of anybody who is believed to have a little money and chastise him with a stick until he agrees to contribute of his means to his sovereign's necessities.—*The Nation*.

Perihelia.

People will discuss the wonders of the universe; and just in proportion as the phenomena are mysterious, will they see signs and believe in the occult influences of the stars. And just now the perihelion of the four great planets—Jupiter, Saturn, Neptune and Uranus—is a source of vague dread to millions of people. It is true they are approaching their nearest position to the sun, and what is to be in that regard has not happened in eighteen hundred years. But history furnishes nothing coincident with similar occurrences, to cause any dread now, though we must conclude that the influence which must be exerted between sun and planets, to keep them in their places and govern their movements, will be more intense in action when nearest together than when separated by the tremendous distances of the outer boundaries of their orbits. Neptune, the most distant of all the planets from the sun, requires 164 years to complete its circuit, while Jupiter requires less than one-twelfth of that time.

But, then, similar stellar perihelia as to other planets have occurred, the last one of any note being in 1708 and following years. But this was not marked by any unusual phenomena, and there is no reason to suppose that it will be so in the case of these four. The distances of Uranus and Neptune and in fact both the others, are so great as to preclude the supposition that the influences from them will be any more marked than in like positions of inferior but nearer planets.

There is, in fact, nothing upon which to ground apprehension or to find cause for any baneful results from these planetary conjunctions, or that they even exercise a sway upon the meteorological conditions of our earth. Their perturbing force seems limited to a slight alteration of the elliptical orbit of the earth; and beyond this they do not appear to affect our little world, but, like all large bodies toward smaller ones, are complacent and kindly disposed.—*Kansas City Journal*.

WE confess we do not feel very friendly towards the English sparrow. We may not know how much good he does; but we certainly do know that he does a great deal of harm. During the past season, flocks of sparrows have frequented our wheat-fields; and the quantity of grain broken down by them has been considerable. They fly upon the head of grain, which at once falls to the ground under their weight, breaking the straw as it falls. As soon as they have eaten the kernels of one head, another is broken down in the same way; and this is continued until they have eaten their fill. Their worst depredations were confined to the ripening grain, at that stage when it was between milk and dough.—*Rural New-Yorker*.

Our Exchanges.

Mr. McFarland, living five miles east of here, raised a crop of 750 bushels of wheat. The average per acre was eighteen bushels.—*Burrton Telephone*.

Frank McCracken has a watermelon that weighs eighty pounds. It should go to Bismarck and to our fair, if it can be kept.—*Oskaloosa Independent*.

Two men bought a quarter-section of raw land in Miami county last spring, on credit, for \$1,200. Their first crop of flaxseed nets them \$1,350, or \$150 more than the price of the land.—*Hartford Call*.

Sheep are coming into the county by the thousand. Every day we hear of some flock not mentioned before. Pawnee will be the banner county in the valley for sheep husbandry.—*Larned Chronoscope*.

Under the Kansas game law, prairie chickens may be killed from August 1st to February 1st; pheasants, October 1st to March 1st; quail, October 1st to January 1st; wood-cock, wild turkey and deer, August 1st to March 1st.

Mr. Geo. W. Sheets, of German township, brought in a sample of Smith county flax this week, that would seem to indicate that the crop could successfully be cultivated in this part of the west. There is money in it for the farmers; and we would suggest that every farmer cultivate some.—*Pioneer*.

The grape and wine industry in the United States is assuming large proportions. The following estimates are approximately correct: Missouri has 1,500 acres of the vine in cultivation, producing last year 500,000 gallons of wine; Sandusky, Ohio, and vicinity, including the Lake Erie islands, 4,000 acres, producing 16,000,000 pounds of fruit; California, 60,000 acres in grapes, representing in money, including land, \$30,000,000.—*Leavenworth Times*.

As will be seen in this issue, quite a number of leading farmers of Hayes and Highland townships, have warned persons against shooting on their lands. Having talked with several of them, we learn that they are not so much opposed to the killing of chickens and other game-birds, as they are to having teams driven over their hedges, fences torn down, and other trespasses committed by "pot hunters" who have no respect for the rights of farmers.—*Clay Center Dispatch*.

The shipment of hogs from Miami county is a source of immense revenue to our farmers; and from the farmers the money circulates among all classes of business men. During the month of July, there were shipped from Paola, on K. C., Ft. S. & G. R. R. alone, 30 car loads of hogs, at an average per car of about 65, making 1,950 head. These, at an average weight of 295, would aggregate 536,250 pounds; and, at the present market price, make the magnificent sum of \$21,450.—*Paola Spirit*.

A rumor has been current on the streets during the past week, that petroleum, or rock oil, had been found at several places in and near this city. It is a well-known fact that much difficulty was had at the McCampbell salt well, to sink a 2½-inch lead pipe to the bottom (some 400 feet, through 200 feet of water impregnated with 33½ per cent of salt), on account of the mighty pressure of gas, which resisted many attempts to sink the pipe. This gas is easily ignited, and burns with brilliancy. It is said that there is enough gas constantly escaping to light the city, and that it is McCampbell's intention to run his machinery and boil his salt water with it, if he can sufficiently confine the gas for the purpose. The gas has caused many comments as to its cause, but no satisfactory answer was had until the past week.—*Wichita Republican*.

THE INDUSTRIALIST.

SATURDAY, AUGUST 21, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Vol. 6, No. 1.

With this number the INDUSTRIALIST, after a brief suspension during vacation, according to the fashion of college papers, enters upon its sixth year, with the opportunity and the will to do more work and better during this year, than any preceding one of its existence. We are happy to be able to state that the prospects of the College are bright indeed; and, unless "all signs fail," the attendance, during the coming year, will be greater by far than ever before. But whether this prove true or not, the INDUSTRIALIST will continue to inform our friends of the work done on the farm and nursery, and in the shops and classrooms; and especially to advocate improved methods of farm culture, and that system of education which aims to make useful hands as well as wise heads.

The New Catalogue.

No general catalogue of the College has been issued since the summer of 1877. The present one, therefore, includes the names of all students present at any time during the three years past. These are classified according to their advancement when last in attendance.

The summary shows the whole number in attendance during these three years to be 458, 276 of whom were present the past year. The number in 1877-8 was 150, and that in 1878-9 was 207. All these came from 61 counties in this State and 11 other States. Such an increase of numbers, coupled with a fact, which does not appear in the catalogue, that the average age of students has also increased almost one year, shows that the reputation of the institution is advancing from year to year.

The bulk of the forty pages is taken up with the usual account of the objects, methods and means, intended to answer the multitude of questions always arising. This part of the catalogue has been wholly rewritten, from the statement of endowment to the calendar. After a brief statement of objects and an outline of the courses of study, full explanations of each department of teaching and of general privileges offered, are meant to be exact statements of what exists. Terms of admission, expenses, earnings, and brief descriptions of buildings and means of illustration, complete the catalogue proper.

As a supplement of six pages, there is a list of officers since the beginning in 1863, with the period of their continuance, and a list of graduates, with the degree received and the present residence.

A concise business directory for College affairs, finds place on the inside of the cover. The whole is offered as a sample of work done in the Printing Department.—*President Fairchild.*

Our Vacation.

In the popular mind the idea of vacation is always associated with fishing, hunting, boating, and amusements generally; and we sincerely hope that for our students the vacation period, now so nearly at an end, has something of this significance. But certainly with the teachers of this College, the "fun" part of vacation has been omitted this year. Of the work done and changes made by or under the direct supervision of members of the Faculty, we can only mention the most obvious matters; but much of this, we think, will strike our visiting friends most favorably.

The catalogue, although somewhat delayed, has been worked up and printed wholly during vacation, and is now generally distributed. For the fulness of its contents and its excellent arrangement, we are indebted to President Fairchild. In printing the catalogue and sundry circulars and letter-heads, Sup't Stewart has done rather more than to keep out of mischief.

On the farm, in addition to the labor demanded by the growing crops and stock, time has been found for a good deal of work generally classified under the heading of "permanent improvements." The old implement shed and its contents have been moved to a convenient position south of the barn; the corn-crib formerly near the pig-gery has also been moved, and is now permanently located a few feet northwest of the barn; several fences have been changed; and a considerable grading has been done north of Societies' Hall.

The Mechanical Department has played the part of the "handy man" very efficiently. An important part of the work of this department has been to rearrange Societies' Hall. We can only indicate a few of the more important changes that have been made in this "venerable pile." On the eastern end of the building, a suite of seven rooms has been partitioned off, which are now occupied by Prof. Shelton. The Society room has been greatly increased in size, and improved in a way that will delight both Alpha Beta and Webster. We are satisfied—although it may seem like presumption to say so—that upon this one subject these emulous societies will be agreed. Several rooms have been partitioned off from the large room in the south side of the building; the main hall, formerly extending through the entire length, now does not exist; and the whole building has been greatly improved in appearance and usefulness.

Hereafter, the sidewalk connecting Societies' Hall with Mechanics' Hall will pass to the west of its present location, near the President's house, and join the west instead of as now the east end of Societies' Hall. It will be seen from this that no longer, in passing to and from chapel, shall we pass beneath the classical box-elders and wormy soft maples, which in two straight, corn-like rows have so long enveloped the old board walk; but the new walk will have advantages over the old, for all that.

In addition to the above, buildings have been put in excellent repair, an entomological cabinet has been made, unbound numbers in the library have been put in shape for binding, and at least three members of the Faculty have found time to teach classes and deliver lectures before institutes in different parts of the State.—*Prof. Shelton.*

Our Agricultural Colleges.

Whatever else is expected of our agricultural colleges, it is certain that they must be fit training schools for the youth of the land, or cease to exist. That they should hold up to admiration "a model farm," or carry on extensive researches into the mysteries of farming, may or may not be desirable, according to surrounding circumstances and available means; but every endeavor must be made to give to their students a practical training of hands, mind and heart for the work which falls to their lot.

Just how much technical training ought to fill the time of a student, and how much attention should be turned toward proper training to think, no one could decide beforehand. Experience is fast leading into the golden mean between the extreme of pure intellectual drill suggested by classical models and that of mere technical information

and skill suggested by old-fashioned schools of law and medicine.

The most successful agricultural colleges, in students, prestige, and influence upon agriculture, have adhered to such a training as gives real education of intellect, along with such constant and varied information and training in the art of tilling the soil as keeps lively an interest in agriculture everywhere. The trained observer and reasoner, who brings warm sympathies into any branch of farming, finds his chief advantage, not so much in superior information directly as in the ability gained to use experience to advantage. The information is necessary as a help to experience, not as a substitute. The truly educated farmer, like the educated physician, is enabled to reason for himself in the practical questions of his calling so as to advance with every addition of experience. The drilled artisan without such education follows his routine fairly, but is left behind with every advance in his art.

The assumption that this broader education tempts away from the practical arts, is not well founded. While it is true that the usual college education is seldom put to use in farming or any other art, it is rather because the drift of feeling through the course has been to other kinds of labor than because such training unfits for such work. When the newly developed ingenuity is rightly turned in daily surroundings and labors, it finds no field more encouraging to its exercise. This is proved by the history of agriculture and horticulture during the last fifty years. But it is still better established and illustrated by the experience of a few institutions whose course has been consistently maintained in the direction indicated by these facts. Most notable, because longest established in this way, is the Michigan Agricultural College. Opened in 1857, it had its early experiments in long course and short course, in general discipline and technical drill; but soon settled into a four-years' course of real study, associated with daily drill in practical affairs and constantly increasing illustration of experimental agriculture. The results are worthy of study. While the intellectual training has been more and more complete from year to year, the tendency to use this trained intelligence directly for agriculture has increased also. It is not so generally known as it ought to be, that more than fifty per cent of its graduates are directly engaged in agricultural pursuits, and less than twenty per cent are in the so-called professions; while hundreds of its students have gone out without a degree, to a definite success in practical farming and a wider influence in its promotion, on account of their brief intellectual training.

In spite of the fact that farming demands more capital in the beginning than any of the professions, many struggle over this obstacle. Such a bent is given throughout the course as leads to lifelong interest, even when the way to its pursuit is closed. The only minister among its 190 graduates was long the president of a notable farmers' club, and has kept his pen at work in agricultural interests. A few lawyers among its graduates are widely known for their interest in agricultural growth and education. The leading agricultural papers of the country draw from this fountain, and its influence is being felt in many State institutions of less experience. In spite of keenest local opposition, the Agricultural Colleges of Mississippi and Texas have found it wise to follow other similar institutions in taking professors from among the graduates of the Michigan College.

This is no plea for that College, since it

needs none; but it is a plea for thorough education, not only in but with agriculture and similar arts, that one who takes such a course may feel himself the equal of other educated men, while his powers are exerted in the field nearest his thoughts. The development of agriculture in our State is but just begun; and its growth will depend upon the thinking men whose training enables them to make most of the experience of each new year. Such a strong course of study, where the tone of thought and feeling rings with interest in advanced tillage and enlightened farmers, makes truly practical men and women, who use their skill, not only to get a living for themselves, but to raise their calling with them.—*President Fairchild.*

Educational Gossip.

Kirwin is erecting a \$6,000 school-house. Abilene has a school-bonded indebtedness of \$27,568.

The University of Kansas has entered upon its fifteenth year.

Prof. Sands, of Linn county, has been elected principal of the Sedan schools.

The expenses of the Alma school district amount to \$9.35 per capita of children of school age.

Rev. Dr. DeLew has been elected principal, Judge E. Hill president, and Rev. I. D. Hewitt vice-president, of Wichita College.

The late general conference of the Methodist Church resolved to take a pledge from future candidates for the ministry, not to use tobacco.

The Burlington Patriot claims that the large attendance of beautiful school-marms at the late institute, frightened all the old bachelors to the brush.

The fall term of the Emporia Normal School will open September 8th, 1880. The examinations for admission will be held September 6th and 7th.

The wagon in which John Brown immigrated to Kansas from Pennsylvania, has been presented to the State Historical Society. It will be exhibited at the State Fair next month.

At the recent examination of teachers in this county, there were 95 applicants, 86 of whom received certificates, divided as follows: "A" grade, 11; first grade, 53; second grade, 22.—*LeRoy Reporter.*

Prof. T. A. Sawhill, a graduate of Bowdoin College, and who for a number of years has been the principal of an academy at Savannah, Ohio, is to have charge of the Concordia public schools during the next ensuing year.

J. K. Hudson, of the *Daily Capital*, will begin the publication of a new and much-needed monthly magazine, to be called *The Kansas Horticulturist*. The subscription will be \$1 a year; and the first number will be issued in September.

The students of the Reno County Normal Institute, at its close, presented Prof. McBride, of Neosho Falls, one of their instructors, with a beautiful gold pencil, and a handsome autograph album with the names of the entire Institute in it.

The Wichita Republican says: Work on the new school-houses in the first and fourth wards, is progressing as well as could be desired; and, if we are to judge, is being done right up to plans and specifications. The brick-work of the first-mentioned is up a half-story, and the first story of the latter is completed.

The proposition to vote \$8,000 in bonds for the purpose of purchasing ground and building a school-house for the colored children, and for repairing the old brick school-house, was defeated by a small majority at the election held on Saturday. But little interest was manifested in the matter; and only about one in every five voters went to the polls.—*Wyandotte Herald.*

The *Educationalist*, of Emporia, has undergone quite a transformation since our last issue. It has decreased into *Educationist*, increased in size, changed its form to an octavo, moved to Topeka, and is now edited by Prof. Geo. W. Hoss, late of Indiana. It is a first-class journal in its particular field, and deserves the support of every one of the six thousand teachers of Kansas.

THE INDUSTRIALIST.

SATURDAY, AUGUST 21, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Miss Cora Hunting is visiting friends in Irving, Marshall county.

Regent A. J. Hoisington is preparing to put in eight hundred acres of wheat this fall.

President Fairchild went to Salina Tuesday on College business, returning Wednesday morning.

Prof. Popenoe is engaged in budding peach seedlings. He is experimenting with about fifty varieties.

A force of "exodusters" is cutting and shocking corn in field No. 6. A large yield both of fodder and ears is reported.

Prof. Ward is in the mountains, enjoying their cool breezes and beautiful scenery. He expects to be in Leadville this week.

The Manhattan Cornet Band, assisted by the musical talent of the city, is preparing "Pinafore" for the Riley County Fair.

R. A. Hollenberg, who has worked in the printing-office during part of the vacation, is now visiting friends in Washington county.

Judge Dunton, of Vermont, an old resident of Manhattan, was on the Hill Tuesday, inquiring particularly about alfalfa and its culture.

Sup't Graham started on Monday for the flat and unhealthy plains of Illinois, his former home, to be gone—no one could find how long. No cards.

Our students who are musically inclined will be glad to hear that Manhattan has a music store. The enterprising proprietor is our own Professor Hofer.

Prof. Platt and family have been spending a fortnight very pleasantly at Bismarck Grove, attending the Sunday School Convention and the Church Encampment. They are expected home every day.

Besides the improvements mentioned elsewhere, we notice some additional shelves in the library, a new desk in the President's office, a large paper-case in the printing-office, and a cistern just east of Horticultural Hall.

New students are prospecting already for rooms and board, and applications for information are numerous. Any one wishing boarders or roomers will confer a favor by sending names, accommodations and terms to the President.

Prof. Failyer has returned from the Michigan Agricultural College, where he pursued chemical studies requiring an extensive laboratory. He and his wife are now making a short visit at the home of his parents, in Chautauqua county.

Examinations of teachers for State certificates are held August 23d to 27th, in Topeka, Lawrence, Emporia, and Manhattan, under the charge of resident members of the State Board of Education. Several students of the College are among the candidates.

Prof. Shelton is at present interviewing the model farms and stock ranches of central Kansas. On Wednesday he and his family started for Elmdale, Chase county, where they will spend a week with S. M. Wood, President of the Board of Regents.

Mr. N. A. Richardson, valedictorian in the class of '80, was recently elected principal of the Long-ton city schools. Considering the number of applicants for the position, the selection of Mr. Richardson is a high compliment to himself and also to the College.

Miss Maria E. Sickels has been selected as one of the teachers in the Manhattan public schools for the coming year. After a short visit to her home in Missouri, Miss Sickels will return to Manhattan ready for the year's work. She is a talented young lady, and is peculiarly fitted for the position assigned her.

The College has received visits during the summer from many of its friends. Hon. A. B. Lemmon, State Superintendent of Public Instruction, President R. B. Welch, of the State Normal School, Hon. W. I. Chamberlain, Secretary of Ohio Board of Agriculture, and Prof. Culbertson, of Nebraska University, are among the number.

The County Normal Institute held in Manhattan during the month of July, was voted a success by some seventy teachers who enjoyed the instructions of Sup't Lee and Profs. Hay and Platt. Evening lectures were given by Prof. Hay, of Cherokee, Dr. Bishop, of Salina, State Sup't Lemmon, President Welch, of Emporia, and President Fairchild.

The new College catalogue has been out a week, and already has been pretty extensively circulated. We have heard many flattering things said both for the matter and mechanical execution of this catalogue; but, for fear that Stewart might blush and thus dim the splendor of the noon-day sun, we daren't say half what we think about this particularly neat job of printing.

This number of the INDUSTRIALIST is sent to all our old subscribers. The time for which many of these persons have paid, has expired; and, unless the subscription is renewed at once, the paper will be discontinued hereafter. At the low price of fifty cents per year, every old student should take it, whether he intends returning to College or not. Let all who desire the INDUSTRIALIST during the coming year, send in their names and half-dollars immediately.

BOARD MEETING.

A meeting was held, according to adjournment, Aug. 3d to 5th.

Reports of Land Agent, Treasurer, and members of the Faculty, were presented and accepted.

Expenditures were authorized for additions to zoological collection, advertising stock, apparatus in Chemical, Printing, Mechanical and Telegraph Departments, and repairs upon College well.

Vouchers of last quarter, 1879-80, were approved; also, for the month of July, 1880.

Committees were appointed to attend to Salina property and to prepare the annual report of the Board.

The time of next meeting was fixed for Tuesday, Sept. 28th.

We are in receipt of a catalogue of the State Agricultural College, 1877-80, which proves the value of the Institution to the State.—*Lawrence Tribune.*

If you want a genuine practical education, we can cheerfully recommend you to the Kansas Agricultural College, at Manhattan. The Faculty is composed of the best professional talent to be had in the country.—*Wabunsee County Herald.*

NATIONALIST ITEMS.

Grace Strong has engaged a school above Rocky Ford.

Arrangements are being made for running the Elevator Co.'s flour-mill night and day before long.

Prof. John Walters has been visiting his folks in Davis county, but is home again, getting ready for his work at the College.

P. W. Zeigler is building a stone addition to his hardware store, which is nearly completed. It is 25x82 feet, and will be used as a warehouse and repair shop.

Miss Sarah Thackery fell from a buggy a few days ago and injured her spine. Serious fears, we hear, are entertained in regard to her total recovery.

The College Farm never looked better than it does this summer. Profs. Popenoe and Shelton have devoted their time to its improvement. The nursery and orchard—Prof. Popenoe's department—is looking better than we ever saw it. The farm, stock and grounds are being constantly improved; and Prof. Shelton ought to be justly proud of the result of the year's work.

THE NEXT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued can be seen by reference to the general course of study on the fourth page.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort

should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms. Plans for giving to the library greater efficiency are already under advisement.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid

advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

RAILROAD TIME-TABLE.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 8:07 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 5:25 A. M.

Nos. 1 and 2 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday.
GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend.
W. N. ROSE, President.

MISS LIZZIE COX, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.
M. A. REEVE, President.

WIRT S. MYERS, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.
G. H. FAILYER, President.

D. S. LEACH, Secretary.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings, Apparatus illustrating the course in Practical Agriculture.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering. Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

Agricultural College Lands.—These lands are in the market, as provided by law, and for sale for one-eighth cash, balance in seven equal annual payments with ten per cent interest, payable annually. The lands are all choice selections, and prices range generally from \$5.00 to \$6.25 per acre. Some of the best tracts are appraised at from \$8 to \$10 per acre, and they are well worth the money. These lands are located in Washington, Marshall, Clay, Riley and Dickinson counties. For particulars, maps and descriptions, address L. R. Elliott, Agent, Manhattan, Kas.

Instrumental Music.—Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three. Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught. For terms, see heading "Expenses" in article entitled, "The Next College Year."

THE INDUSTRIALIST.

SATURDAY, AUGUST 21, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or House- hold Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoes and crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.
Stems: Their derivation; their offices and properties; their relation to other parts of words.
Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.
Compounds: Their value; their properties and uses; the laws governing their formation.
Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing in the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE,

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected summer stock on hand. Opposite post-office, Manhattan. 11-26

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange are issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Instrumental Music.—Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three. Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught. For terms, see heading "Expenses" in article entitled, "The Next College Year."

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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

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TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

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GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

An Agricultural Outlook.

The recently published report of Messrs. C. S. Read and Albert Pell, who were sent by the Royal Agricultural Commission to enquire into the condition of agriculture in the United States and Canada with reference to its prospective influence upon British farming, is of course of interest to Americans. The report asserts that settlement of our free lands and the termination of the free ranges, by means of which millions of cattle and sheep are grown so cheaply, will increase the cost of production and consequently raise prices, which will be further enhanced by the increase in population, and therefore that the contest for agricultural supremacy will not result wholly in our favor,—self-evident conclusions, but so simple that Americans have not thought of them, and of great importance to the two nations. Free lands, cheap production and transportation, and favoring seasons here; high rents, oppressive taxation, and bad weather there,—have combined to produce an agitation in the United Kingdom that bids fair to end in a land revolution, involving radical changes in the social system and in the methods of English agriculture. The British farmer prospered by reason of a dense population engaged in profitable manufacturing and commerce, the absence of injurious competition, and high prices for meat and wheat. American competition has made these products unprofitable, and they must give way to other crops; but farmers change slowly, and the interim is black with uncertainty,—tempered, however, with the certainty of the repeal of obnoxious laws by the Liberal Government.

Though gathering momentum from the beginning, the great progress of this country has taken place within the past twenty years, owing to the rapid settlement and cultivation of Western lands; and we have been going on as if there were to be no exhaustion of the impelling force. The Government Land Office supplies few facts for a careful analysis of the land question, but we can sift out enough for our purpose. The public domain in the "land States" comprised 1,814,788,922 acres; of this amount, 734,591,236 acres had been surveyed and presumably disposed of up to June 30, 1879. Deducting also the Territory of Alaska, the unsurveyed desert territories of New Mexico, Arizona and Utah, Indian Territory, and the public lands in Florida and Louisiana, we have left about 500,000,000 acres in the desirable Northwest region; but from this we must again subtract the millions of acres of forest, mountain, swamp, desert, isolated flat prairie, water courses, and sterile land, which as a gift even would be a poor investment; also, the many thousand unsurveyed "claims" of the pioneers. What remains of good land is now being disposed of at the rate of nearly ten million acres per year, and in an increasing ratio. In traveling through the Territories, one sees the pioneer close to and among the foot-hills of the Rocky Mountains. Where five years ago buffaloes stopped the railroad trains, now are seen grazing cattle and fields of wheat. The man who went to the frontier five years ago, now has a vanguard several hundred miles in advance of his ranch. The picket-lines of the approaching armies of settlers from the East and from the Pacific, have met in the middle belt in Colorado and Utah; and the vast territories to the northward are being rapidly overrun by the conquerors. The graziers on the free ranges in New Mexico, Colorado, and the Northern Territories, already complain of being crowded; and many of them are acquiring and fencing in large tracts for pasturage, which is a virtual abandonment of the free-grazing system. At the present rate of settlement, the desirable free "homestead"

lands will probably all be occupied before this decade has ended. There will still be many million acres of good land in the market at low prices, for, unfortunately, the railroads possess a large portion of the best land in the Northwest; but even ten or five dollars per acre is very different from a free range over thousands of acres, and the land will necessarily more rapidly increase in value after the free lands are disposed of. Then there will be a corresponding advance in the cost of production. It matters little, under the free-range system, that a bullock requires several acres to graze upon; but on purchased land it is a factor which demands a different system of management, and more capital in the business.

Increased cost of production in a producing country, of course, means expansion of prices in the markets of the world. What this increase will be, it is impossible to state, for there are other agencies at work to determine the result. Australia is becoming prominent as a food-producing country, and her position will be enhanced by the better facilities for transporting dead meat, which are sure to be discovered soon: her wheat now commands a higher price in London than does American. Southern Russia contains vast tracts of as fertile soil as Kansas can boast, and steps are being taken for its development. India now sends wheat of superior quality to English markets, and her minister of agriculture reports her resources in that line as very great. What position the Continent of Africa, now being opened, is to hold in the world's markets, is an important but unknown element in the equation: her immediate influence will be slight.

That our soil products will be greatly augmented as more land is tilled and better systems of culture are adopted, may be safely affirmed; but it may be assumed, also, that the increase in amount will in the future, more nearly than in the past, keep pace with the growth of population. Then we shall have, proportionately, a smaller surplus to export. With less to sell abroad, and that at higher prices, our influence in foreign markets would cease to be the evil genius of British and Continental farmers. But, even though we lose our agricultural supremacy abroad, the present outlook is that American agriculture will progress quite as rapidly henceforth as it has thus far done. Similar influences operated thus in England up to a few years ago, when the great tide of American competition poured into her markets, reducing prices without a corresponding rebate in the cost of production. The older States will suffer less from Western competition as the cheap lands become more valuable and home consumption increases with the growth of population in the sparsely settled districts. Western farmers will adopt more systematic and scientific and economical methods. Farmers generally will be obliged to use more working capital, which they will be enabled to do by reason of higher prices, and the facilities which will be forthcoming for the readier borrowing of capital on real-estate security. Business principles, with something of the system of manufacturing establishments, will continue to be applied in an increasing ratio. Crops will become more localized. It is rapidly being determined what products are best adapted to particular sections. East, West and South may compete less with each other. Such products as blooded cattle, horses and sheep; poultry, milk, small fruits, and garden crops; tannin-producing, fibrous and other plants used in manufacturing,—may become the profitable specialties of the thickly populated districts: cereals, meat, cotton, wool, sugar, etc., of the broader fields and pastures. The sugar-beet rejuvenated the agriculture of Germany and France: the development of the indus-

try for the production of sugar from beet-root and from sorghum, is making rapid strides here; and, as we showed a few weeks ago, bids fair to save a large portion of the hundred million dollars now sent out of the country annually for sweetening. Our special crops, among them tea and coffee probably, will assist our agricultural progress. With greater prospective emoluments, we may expect that many able young men who now seek commerce and the professions, will become farmers, which, with the slowly growing army of educated agriculturists, will tend to elevate the calling to the degree of dignity which it has attained in England and Saxony.—*The Nation*.

Our Exchanges.

Many of our farmers are cutting up their corn. Late planting, owing to the recent dry weather, will not yield more than one-third of a crop.—*Wichita Republican*.

The *Daily Tribune* says: "It has been part of the farmer's nature to grumble and to predict ruin to himself ever since the days of Cain, who was the first of them all."

The supply of fat cattle from Colorado this season, will be light. The drouth that has prevailed there so long, has dried up the grasses; and thousands of cattle have perished, or been driven out of the State to feed.—*Prairie Farmer*.

The sugar-mill was ready and commenced regular operations Tuesday afternoon. The cane which came from Messrs. Rhinehart and Stepvater yielded a full quantum of juice, but not so rich as it will be a little later.—*Anthony Journal*.

A Lyon county cattle dealer recently returned from Chicago with a check for \$21,000, the proceeds of a shipment of cattle which were fed about six miles from Emporia. This is doing very well for drouthy Kansas.—*Emporia News*.

The contract has been let to C. J. Jones, of Garden City, for digging the irrigation ditch, by which the city of Great Bend will be irrigated. The length of the ditch is to be seven and one-half miles, and the price \$500. The river will be tapped two miles above Jacob Bland's, and will extend to the west limit of the city: the ditches through the city will be dug by separate contract, as it is not yet decided where they will be located. The ditch is to be capable of conveying a stream of water two feet deep and twelve feet wide. It is to be completed within forty days after notice that all things are ready. Right of way has not yet been granted by two or three parties; but as soon as it is secured the work will be commenced. This enterprise, we believe, will be greatly valuable to our city.—*Great Bend Register*.

Having just passed over the Republican and Solomon valleys, I thought I might send you an item or two in reference to the country, that would be interesting to your readers. In the first place, the contrast between these two valleys was never so marked as at this time. The Republican shows the pinched appearance from drouth, while the Solomon looks fresh and green, except where chinch-bugs have made inroads upon the corn-fields; but west of Beloit the country has been almost burned up. No wheat and very little corn as far as Kirwin; west of there the crops have all failed. I noticed a singular phenomenon west of Beloit, which may prove the dawn of better prospects for the far west. In one of the corn-fields, dead and dry from the effects of drouth and chinch-bugs, there appeared a good stand of blue-grass, almost covering the ground, its shining dark green just blossoming in marked contrast to the sear leaves of the corn, which had succumbed to the fierce heat.—*Special Correspondence to Leavenworth Times*.

THE INDUSTRIALIST.

SATURDAY, AUGUST 28, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Oats with Wheat, Again.

That pretty annual, or we should say perennial, item advising farmers to sow oats with their winter wheat, has made its appearance, this time in the columns of the *American Agriculturist*, which says: "The sowing of a bushel of oats per acre with the winter wheat, has often proved of material benefit to the wheat crop. The oats grow more vigorously than the wheat, and aid in catching and holding the snow. The oats act as a protection or mulch to the wheat."

The substance of the above item has received a wide circulation during the past three years; but, as we have seen nothing of it for some months, we had hoped that at last it had obtained a little much-needed rest. As we have in these columns repeatedly shown the folly of the practice recommended above, we shall for the present content ourselves with saying that, both in Kansas and Michigan, we have seen a number of instances of wheat cultivated with oats, as recommended above, and with the uniform result,—a greatly diminished yield of wheat. We are confident that the farmer who, acting on the *Agriculturist's* advice, sows oats with his wheat, will find the practice but "sowing wild oats;" and, like the peccadillos of youth, the offense will not likely be repeated in the face of much experience. Wheat should be sown upon land that is free from foul seeds; and whether these are purslane, sunflowers or oats, makes little difference.—Prof. Shelton.

Dr. Tanner from an Agricultural Standpoint.

Now that Dr. Tanner and his horrible "mucous membrane" have been safely laid aside,—the late exhibition having apparently quite sated the public appetite for this class of shows,—it may not be amiss to call attention to the matter of regimen in connection with farm stock.

It is a general truth, and one admitting of very few exceptions, that the conditions being equal, that animal will pay the best that consumes the largest amount of food. Of course, individual animals may often be seen which are small feeders and very good feeders; but even these exceptional animals would undoubtedly be fed with greater profit if, by making their food more attractive and palatable, they can be induced to consume more largely of food. This fact is shown by the results of all the "feeding experiments" with which we are acquainted: invariably, the greatest increase for a given time, and the largest returns for food consumed, are obtained when consumption is at the maximum.

But it is not enough that the animal is a gross feeder simply: it is a matter of still greater importance that this food be digested and assimilated, and especially that it be applied to some definite and useful purpose in the animal economy. This brings forward the question of the relations of feeding to health and disease, and the additional question of the aptitude of the different breeds for feeding, which it is not our purpose to discuss in this article. It is sufficient for our purpose to say that that vigorous "pushing" which we call full feeding, cannot be successfully carried on except with animals of perfect health. If the boiler is weak or the machinery defective, then the heavy head of steam only hastens the final collapse.

There exists, we know, among farmers

and stockmen, much ignorance and positive misinformation on this subject. When an animal is slightly indisposed and "off feed," every effort is made at once to induce him to eat, as though his loss of appetite was the difficulty, instead of regarding it as it is, a symptom or rather effect of disease. Even if food is forced into the animal's stomach, it remains undigested and a source of irritation, and tends to complicate the disease and prevent the return of health. Another common mistake is made in the case of those animals which have recently given birth to young. It is a common practice to provide such animals with an abundance of nutritious and stimulating food, thereby inducing a large secretion of milk when the udder is feverish and quite unable to contain it. The result is, in a large number of cases, garget, inflammation of the udder, and very often that terror of dairymen, milk fever. The practice should always be, after the calving or farrowing, as the case may be, to feed the dam in great moderation, for three or four days, of cooling, loosening food only. Starving an animal to death is a very slow and uncertain process, as some of our farmers can testify quite as positively as Dr. Tanner himself; and the fact that an animal is "off his feed" a few days, ought to occasion no alarm. We had this matter illustrated, three years ago, upon the College farm, when a Short-horn bull, from overfeeding on oats straw, had a severe attack of tympany, which, culminating in inflammation of the stomach, carried him off just six weeks after the first attack. During all these six weeks, the animal ate nothing except a few bottles of gruel, given with medicine to assist its action.—Prof. Shelton.

Notes on Some Grasses.

The enumeration of Kansas plants, begun by Prof. J. H. Carruth, has progressed for several years, until we now have on record the occurrence of over 1,200 species, including the ferns but excluding the flowerless plants. In this list, the grass family is well represented, the total number of species given being 120, which may yet be increased. Of this number of species, some are of course rare and inconspicuous, and others have little or no economic value; yet the list includes as large a proportion of useful species as we could expect to find in a flora of equal extent with ours.

The most conspicuously abundant grasses on the prairies, at this season, are:—

1. Indian grass (*Sorghum nutans*), a tall-growing, coarse grass of no great value, bearing a handsome panicle of tawny spikelets; growing in clumps, often standing five feet in height.

2. Blue stem (*Andropogon furcatus*), a well-known coarse grass forming a large proportion of the coarse hay grown in the meadows along the bottoms. The spikelets, or flowers, are arranged on forked or divergent racemes, growing either on the top of the main stem or on lateral branches. This grass is equally coarse with the last, growing rather taller.

3. Broom grass (*Andropogon scoparius*), growing about one-half the height of "blue stem," in similar situations; forming rough clumps, which are not touched by cattle when other grazing is attainable. The stems and leaves of this grass are covered with a bluish bloom like that which gives its relative the name "blue stem." The persistent hold of the roots upon the clay, and the immunity of the tops from the nips of the omnivorous "town cow," give it the advantage over more valuable kinds; and it is often the only surviving graminea among the roadside weeds.

4. Tall musket grass (*Bouteloua curtipendula*). Flowering stems two or three feet in height; spikelets in opposite rows along the terminal four or five inches of the culm; anthers, orange red; conspicuous; abundant in upland prairie hay.

5. Hairy musket grass, Gramma grass (*Bouteloua hirsuta*), often incorrectly called buffalo grass, which it somewhat resembles when not in flower. The gramma grass is abundant on hillsides and in dry, rocky situations. Its flowering stems are from one-half to one foot high, leafy at base, slender, bearing two or three brush-like spikes an inch apart along the terminal portion. It is too short for hay, and from its dry nature does not attract cattle.

6. Buffalo grass (*Buchloe dactyloides*), still found in small patches upon the uplands; not sufficiently abundant to be entitled to consideration as an element in the grazing.

7. Slough grass (*Spartina cynosuroides*), growing ten feet high in favorable places, producing abundance of long, coarse leaves; of more value for thatching Kansas stables than for any other purpose.

8. Wild rye (*Elymus*, several species), abundant but not relished by stock; the long awns render the heads uneatable. This grass is found principally on slopes in proximity to water.

9. False redtop (*Tricuspis sesterioides*), abundant in clumps in river bottoms, furnishing a certain amount of coarse herbage that before headed out is eaten by stock; a remarkably handsome species, with broad purple panicles borne on culms from three to five feet in height.

10. Wild chess (*Bromus ciliatus*), common in shady situations, principally confined to timbered localities; of no value.

11. *Panicum virgatum*, a tall grass with broad panicles of flowers, growing abundantly in meadows, more common on low land, and furnishing hay of fair quality although rather coarse. When green it is relished by cattle and usually kept cropped close.

12. Beard-grass (*Aristida oligantha*), with fine, short leaves, growing on poor land and on stony hills, often forming a soft, close sward. It is not eaten by animals, so far as I have observed.

13. Saw-grass (*Lurisia oryzoides*), common in wet ground; its rough leaves not often touched. In the Southern States this grass is considered valuable, as stated by Hon. J. S. Gould, in New York Agricultural Report.

In cultivated grounds, other species are conspicuous for the pertinacity with which they maintain their places against the will of the farmer. Most of the following, although readily eaten by animals, are to be regarded as weeds, and some of them of the worst character:—

Sand-bur grass (*Cenchrus tribuloides*), a terrible pest when once it obtains foothold. The culms root at every joint, and the seeds retain their vitality for a long time under ground. It is an annual, and persistent warfare will finally eradicate it. It may be recognized even before seeding by the stem being flattened below, where it is of a dull, purplish red color.

Finger-grass (*Panicum sanguinale*), abundant in gardens and fields; the culms from each stool spread out over an area of a yard or more in diameter, and root at the joints, thus rendering the plant somewhat troublesome to remove after once well rooted.

Foxtail (*Setaria*, two species), notable for the profusion of weeds and the very short time required for their maturity; abundant and troublesome everywhere.

Barn-yard grass (*Panicum crus-galli*), very coarse but succulent; somewhat less weedy in character than the foregoing; growing principally in the vicinity of water, but also found in yards and fields.

Tickle-grass (*Panicum capillare*), abundant. After frost the ripened panicles are broken off by the wind and heaped up along fences and hedges, giving them a very slovenly aspect. A species of *Eragrostis* (*E. capillaris* ?), resembles the last, but may be distinguished by the smoother and shorter leaves and larger spikelets.

Large-spiked *Eragrostis* (*Eragrostis poaeoides* var.), handsome but ill-smelling, having a decidedly "buggy" odor, especially noticeable when the grass is wet; not relished by cattle.

A few other species are found in gardens, but are not worth notice except to the botanist.—Prof. Popenoe.

Educational Gossip.

Clay Center is to have a new school-house, to cost \$15,000.

In 1879 Kansas had five lady superintendents of public instruction.

The census gives the State of Kansas about 1,000,000 population.

There are \$190,268 due Kansas, for five per cent of school land in the Indian reservations in Kansas.

"The first principle of human culture, the foundation-stone of all but false, imaginary culture," says Carlyle, "is that men must, before every other thing, be able to do somewhat."

The average daily attendance at the Coffey county institute was 107, and the highest enrollment 125. Superintendent Robinson and his gentlemanly assistants worked effectually in making it a complete success. Prof. Iles received encomiums from all present.

The mania for nominating ladies for the office of superintendent of public instruction is rapidly growing. Two years ago Mrs. Nichols was elected to that office in Elk county. Now a Miss Benton, of Sedgwick, and a Miss Weeks, of Butler, are each announced as candidates for the office for their respective counties.

Prof. Wm. Crichton has resigned the position of assistant superintendent of public schools in this city for the coming year, and his place will be supplied by Miss Nancy Bailey. Mr. Crichton goes to Florence to conduct the public schools there, as superintendent, a position he is well qualified to fill.—*Newton Kansan*.

The Trustees of the State Charitable Institutions have elected W. H. De Motte as Superintendent of the Deaf and Dumb Asylum, to fill the vacancy caused by the resignation of Prof. Parker. Mr. De Motte was a teacher in the Institution for the Deaf, at Indianapolis, and also Superintendent of the Wisconsin Institution, at Delvan.

The county superintendent of Butler county has written a circular letter to the school boards of his jurisdiction, notifying them that he has recorded on all teachers' certificates the number of days their bearers were in attendance at the normal institute, and requesting the employment of those teachers who can show a full attendance.

This vicinity can boast of a heroic young lady, Miss King by name, who, during the summer, has dug with her own hands, and without assistance, a well 16 feet deep; and broken between five and ten acres of sod, handling the team herself. Who can beat this? And wouldn't she make a good catch for some young Kansas gallant.—*Wa Keeney World*.

The teachers in Labette county, at their last meeting, resolved to adopt the following rules of the American Philological Society, in regard to spelling: 1. Drop *ue* at the end of words like dialogue, catalogue, etc., when the preceding vowel is short; 2. Drop final *te* in words like quartette, etc., and that we use our endeavors to bring them into use in our county and elsewhere.

It will be well for school officers to re-engage the teachers who have done well in their schools, for another term. They have learned the disposition of the pupils, know the progress they have made, and can take them right along. This will avoid friction and experiment. Do the teachers who have done well the justice to re-engage them for the next term.—*American Journal of Education*.

Early last Wednesday morning, the coal in the basement of the public-school building was found to be on fire; and, for a time, it was feared that the house would be destroyed. Men were actively set to work shoveling the coal over, and by about nine o'clock the danger was past. There were about two car loads of coal in the basement; and it is supposed to have ignited spontaneously.—*Valley Falls New Era*.

Prof. Lounsbury has discovered a new use for slang. He says it is the tendency of language, in the hands of the literary class, to become formal and dead; and that slang phrases, having their origin in popular usage, and being coined out of actual experiences by a process of natural selection, become the feeders of the literary language of the people; so that it often happens, that what is vulgar in one age is classic in the next. He derides the idea that language needs watching, and cannot be trusted to the people at large.

THE INDUSTRIALIST.

SATURDAY, AUGUST 23, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Prof. Ward reports himself much refreshed in his mountain tour.

Jno. B. Anderson, Esq., a full head taller than the Master "B." Anderson who left here two years ago, was on the Hill Friday.

Our old friend, Rev. Wm. Knipe, came to the farm on Tuesday, and succeeded in carrying off six nice young Berkshires, at a fair price.

There is a big inquiry for catalogues these days; and, unless all signs are delusive, there will be an unprecedented rush of students hereabouts next week.

A very handsome collection of grasses, tame and wild, may be seen in the waiting-room of the College Building. These are destined for the great exhibition at Bismarck.

Examinations for State teachers' certificates have been in progress in the College Building during the first four days of this week. The class numbers six, we believe.

Prof. Walters has returned, as may be inferred from the appearance of our "gossip" column last week, from a somewhat prolonged visit at the home of his parents, near Milford.

Our drouth has again come to a disastrous end. Somehow we have not had exactly a dry season this year; but, if we had received a single quart of water less than the amount that has fallen, we should have suffered from drouth.

Prof. Platt is still loose among the good folks who infest the camp-meeting at Bismarck. It would seem, from the extract given in another place, that the Professor is making off-hand speeches which are likely to make him immortal.

Hon. John A. Anderson remembers the College by sending valuable public documents: Commerce and Navigation, 1879; Report of U. S. Fish Commissioner, 1876-7; Labor in Europe, 1878; The Metric System, 1879; Cotton Insects, 1879. Such reminders of continued interest in the College are appreciated by all.

A private letter from Judge Kingsbury informs us that the "Texas fever" has been raging among the cattle about Burlington, with great fury. The Judge reports the loss of over 150 head by his neighbors, himself losing nine head, including all his Short-horns except the young bull purchased of the College. We hear of outbreaks of this fever in other sections of the State; and it seems to us that the matter is quite worthy of the attention of the authorities.

The news was received here to-day that Wm. Ayres, a prominent citizen of Silver Lake, dropped dead this morning, soon after arising from his night's rest. He donned his clothes and went out to the barn as usual, to look about the morning chores. A few moments later, some of the men at the house went out also, and found Mr. Ayres lying in the yard dead. It is supposed he must have died from heart disease.—*Topeka Journal*.

Mr. Ayres is the father of Miss Sarah Ayres, an old student of this College. Miss Ayres will have the hearty sympathy of the Faculty and students of this institution, in this great affliction.

The College library seems likely to have its new cases as crowded as the old ones before long. During the summer, donations have been received as follows: from U. S. Department of Interior, three bound volumes and as many pamphlets; from U. S. Department of Agriculture, one bound volume and three pamphlets; from Hon. C. L. Flint, Secretary of Massachusetts Board of Agriculture, twenty-five bound volumes and twenty-one pamphlets (many of these are very interesting in the

history of agricultural education); from G. C. Brackett, of Kansas State Horticultural Society, seven volumes of the reports, with a dozen of 1879 for exchanges; from President Fairchild, four volumes of agricultural reports of different States; from Hon. J. A. Anderson, five bound volumes; and last, from Hon. James Smith, Secretary of State, twenty bound and twenty-five unbound volumes of Kansas documents. Add to these 117 volumes, the 75 or more just returned from the bindery, in George W. Martin's handsome covers, and the book-cases will scarcely know themselves. Yet, "there's more to follow," if promises are kept.

CHASE COUNTY.

Last week, for the first time, we took a short trip up the Cottonwood Valley, as far as Chase county. The trip was a hasty one; but a two days' visit convinced us of the great beauty, natural wealth, and agricultural capabilities of this section of the State. It seemed to us, viewing the matter from a practical standpoint, that Chase county is pre-eminently a stock country. This fact seems to be appreciated by the enterprising farmers of this section; and already the farms are fairly stocked with a good quality of horses, cattle and swine. But not one-fourth of this ground is occupied. Especially this section is adapted to wool-growing; and we are confident that there are more than a hundred good round fortunes awaiting as many young men who, having the pluck and genius to "work and wait," are willing to devote themselves to the business of helping a small flock of sheep grow into a large one.

We spent a few hours very pleasantly in Cottonwood Falls, a pretty, substantial town of six hundred souls, situated on a gentle eminence commanding a fine view of the Cottonwood Valley. Of the Cottonwood Falls court-house, a building costing \$40,000, we have heard much, but not too much. This building has a particularly substantial look; but it is by no means devoid of architectural graces. We have no desire to be critical; but as we looked over this really handsome building, we could not help wishing that the false dials on the tower might be furnished with a genuine "town-clock," or receive a charitable coat of brown paint.

Chase county is also famous for its low rate of taxation, a fact, we believe, sometimes mentioned by its residents and not generally disputed by outsiders. Indeed, in the matter of taxation, Chase seems to have reached an ideal condition which other counties may approach but never quite attain to.

We are under obligations to Hon. S. M. Wood, Mr. Sydney Breese, and others, for many polite attentions during this visit.—*Prof. Shelton*.

AS OTHERS SEE US.

* * * The catalogue of the State Agricultural College was printed in the shops of the College, and is a creditable reflex of the skill in the Printing Department.—*Emporia Ledger*.

Prof. Platt, of Manhattan, in a speech at Bismarck, said that "if the devil ever goes out of the world, he will go out tail foremost, growling and snapping his teeth." This is rather discouraging.—*Champion*.

* * * This institution has grown into one of great popularity and prominence, and is a monument to the progressive spirits that gave to Kansas the most advanced school system ever inaugurated.—*Le Roy Reporter*.

We have received the newly issued catalogue and prospectus of the Agricultural College, at Manhattan,—a very interesting document and mirror of the present workings and prosperous status of that admirable institution.—*Kansas Valley Times*.

We acknowledge the receipt of the catalogue of the State Agricultural College for Kansas, from August 1877 to June 1880. It is very neatly printed on good paper, and is well gotten up as an advertisement of the College.—*Kansas Agriculturist*.

President G. T. Fairchild, of the Agricultural College, also came and spoke for the College. The people were well pleased with the appearance of the President; and his visit to Osage county has made friends for the College.—*A Farmer, in Lawrence Journal*.

The annual catalogue of the State Agricultural College for 1880 is out. It shows the school to be in a highly prosperous condition. The number of students is increasing, and the school is improving in every respect. Kansas may feel proud of her Agricultural College. To get a correct idea of the enterprise and practicableness of this institution, one should either visit it, or subscribe for the weekly College paper, the INDUSTRIALIST, which is printed by the students.—*Harper County Times*.

We have received the catalogue of the State Agricultural College of Kansas; and it presents a very gratifying exhibit of the advance in usefulness, and increase in well deserved popularity throughout the State, of the institution. The number of students steadily increase from year to year. Sixty-one counties of the State are represented by students attending the College; and eleven other States have sent pupils to be educated at the State Agricultural College. The number of different students in three years is 458. While this presentation is very flattering for a young college in a young State, the solid merits of the institution warrant us in saying, without reserve, that the State of Kansas should more than double that number of bright, intelligent farmers' boys and girls. The best system of education ever devised, is that system which enables the pupils to make practical use of it in the life-work of earning a living when they have gone out from the study rooms of the college into the busy world. This is, in an eminent degree, the kind of education imparted at the Kansas State Agricultural College.—*Kansas Farmer*.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

THE NEXT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued can be seen by reference to the general course of study on the fourth page.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urgently advised to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .50
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms. Plans for giving to the library greater efficiency are already under advisement.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLE.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 11:58 A. M.
No. 4, going East..... 3:07 A. M.
No. 1, going West..... 4:03 P. M.
No. 3, going West..... 5:25 A. M.

Nos. 1 and 2 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday.
Geo. C. Wilder, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 p. m. Ladies admitted. New students cordially invited to attend.
W. N. Rose, President.

MISS LIZZIE COX, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

M. A. Reeve, President.

WIRT S. MYERS, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.
G. H. Failyer, President.

D. S. Leach, Secretary.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering. Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

Agricultural College Lands.—These lands are in the market, as provided by law, and for sale for one-eighth cash, balance in seven equal annual payments with ten per cent interest, payable annually. The lands are all choice selections, and prices range generally from \$5.00 to \$6.25 per acre. Some of the best tracts are appraised at from \$8 to \$10 per acre, and they are well worth the money. These lands are located in Washington, Marshall, Clay, Riley and Dickinson counties. For particulars, maps and descriptions, address L. R. Elliott, Agent, Manhattan, Kas.

THE INDUSTRIALIST.

SATURDAY, AUGUST 28, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixed and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design;—to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department. Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

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THE INDUSTRIALIST

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Healthfulness of Fruit.

No intelligent person can doubt that the free use of ripe fruit is conducive to health. On the other hand, it is obvious that fruits, as an exclusive article of diet, do not meet all the wants of the system. The chemistry of the apple, pear, tomato, grape, etc., is well understood, and it can be stated how much nutriment or assimilable food each is capable of affording; but this does not answer all the questions connected with the subject of the healthfulness of fruit. Besides furnishing nutriment, fruit exerts other influences upon the animal economy of the highest importance. The acids of fruit are not properly nutritive substances, but they produce physiological effects of a cooling or corrective nature, which are highly salutary.

Fruits are largely composed of water, and this fluid has come to them through extraordinary channels. The tiny root fibres have collected in the dark earth, and, by vital action, it has been forced through the most minute tubes, until it is finally deposited in the fruit cells. So far as we know, the water undergoes no modifications: it is water in the soil, and it is the same in its wonderful associations in fruits. It, however, holds saccharine elements and other principles which modify its physical appearance and taste. The great amount of water contained in fruits is in itself an advantage, as it aids in cleaning the alimentary canal and other excretory ducts, and thus promotes healthy action.

Fruits are capable of sustaining life for long periods, but the lack of the nitrogenous elements detracts from their strength-giving power, and any one living exclusively upon them would not be able to labor effectively. We have heard of a man who rowed his boat along the coast of New England, sustained alone by whortleberries; but if the voyage had lasted six months, or even three, his nerves and muscles would have entirely failed him.

The present is a season of abundant fruits. Perhaps never in the history of the northern and eastern States have apples been so plenty. The rich and poor can indulge in this noble fruit, to the greatest possible extent, at small cost. If the fruit is largely consumed in connection with a proper proportion of animal or nitrogenous foods, a much higher standard of health will be attained among all classes.—*Boston Journal of Chemistry.*

A Story of an Umbrella.

The *Nachrichten* of Basle tells a story which may give the bold purchaser a hint of a new method of protecting himself against fraudulent shop-keepers. A young gentleman bought a silk umbrella from an umbrella dealer indefinitely characterized as C—. The next day was rainy: the umbrella was put into use, but the silk tore in six places during the first hour of its contact with the rain. The purchaser went straight to the shop, exhibited the ruined article, and demanded a sound one in its stead. C—'s silk umbrellas, however, were made to sell, not to endure use: the dealer smiled politely, and observed that purchasers ought to be careful when they made their selection. The young man took home his umbrella, painted around it the following inscription in big letters: "This is how an umbrella looks to-day which was bought at C—'s shop yesterday," and hired a commissionaire to walk to and fro before C—'s shop with the opened umbrella for a whole day.

This unusual form of advertisement naturally irritated Herr C—, and could not have been without a deterring influence upon possible customers. C— sent for the police, and asked them to arrest the bearer of the umbrella, but they declared that they could see no legal crime in the commission-

aire's proceeding, and declined to take him off to jail. Early the next morning the imperturbable umbrella-carrier appeared again, and he kept sentinel in this manner in front of C—'s shop for nearly a week. At the end of this period, the shop-keeper saw that he must give way, and, calling the man, asked him to go to his employer and tell him that everything should be settled according to his wishes. When the bold inventor of the stratagem entered the shop, the dealer offered him a sound silk umbrella in exchange for the sickly one. The purchaser agreed to accept it, but added the dealer should pay the commissionaire a week's wages, to which suggestion he was also compelled to assent.—*London Globe.*

A New Kansas Industry.

Through the courtesy of the proprietors of the Western School Supply Agency, we were recently shown the method of manufacturing the New Enamel Marble Slated Blackboards. This enterprising firm has recently secured entire control of the manufacture of these boards, which bid fair to supersede all others in use, and become an important item in Kansas manufactures.

The body of the board consists of a mixture of wood and paper pulp, similar to that used in the manufacture of pails, barrels, etc., which is pressed into sheets by hydraulic pressure. These sheets are then covered by a metallic enamel, which penetrates the surface of the board, and in a short time becomes as hard as marble itself. It is then "cut down" with emery and pumice-stone until a hard, smooth, elastic, surface is secured. The most careful manipulation is required to get the chemical proportions of the enamel exact, as it is on this that the great excellence and durability of the board depends. The enamel surface is finally covered with three coats of the liquid marble slating, after each of which, except the last, emery and sand-paper are freely used, to give a fine writing surface.

After a careful examination of the methods of manufacture, we cannot but believe that it is almost indestructible, as cracking, warping or shrinking, are out of the question.

In price it is far below any good blackboard ever presented to the public, and comes within the ability of the poorest school district to purchase. The firm has orders for nearly two months ahead, and is enlarging its capacity to manufacture by additional room.

We wish this new Kansas industry abundant success.—*Kansas Farmer.*

The Farmer's Boy.

There has been much written on the subject of boys leaving the farm to follow other pursuits; and many writers lament the fact that this is so often the case, and they take occasions to lecture to our farmers for not educating their boys to honor the calling of their sires. The question has been so often written about, and the subject has become so threadbare, that there is nothing new to say: the arguments have all been used, and, as the lawyers say, the case is all in. But there is another side to this, which few writers take note of, and that is that the world is moved to-day by farmers' sons. The great work of this age demands the push organ of manhood, as developed on the farms; and the farmer's son who refuses to go when he is called, will be untrue to himself and his kindred.

The farmers of our country have nothing to be ashamed of. Their sons have done their share in the development of the resources of this great country and the golden age in which we live. They, as a class, are not brought up to become loafers or idlers and tramps: the work of their hands can

be seen, no matter which way you go. It is too common to associate the farmer's son with and speak of him as an unlearned, awkward countryman. It is true he does not resemble the city fop or dandy; but there is manliness in the grasp of his hand; there is courage in his heart; and he possesses the nerve to undertake and carry forward enterprises which are daily the admiration and wonder of the world. We say, all honor to the lad who has courage to make out a life for himself, let it be on the farm or in the crowded walks of city life. There is honor to be won, and a fair share of it belongs to the farmers' boys.—*Stock Farm and Home.*

Our Exchanges.

George Davis, the negro who stole a horse at Hunnewell, a few days ago, and sold him in Winfield, was arrested Thursday morning. On Thursday afternoon he plead guilty, and was sentenced by the judge to two years' labor in the penitentiary.—*Cowley County Monitor.*

The crops lost this season on lands which might have been irrigated in the Arkansas Valley, could they have received a copious supply of water at the proper time, would have been worth the expense of all the irrigating ditches necessary to furnish the water.—*Sterling Gazette.*

Among the productions of the county, recently left at our office, we mention a sample of millet six feet high, left by John Parrot. Radishes two feet long, brought in by Mr. Mayfield, and a fine sample of corn from the farm of John Shell, on Big Timber Creek.—*Mankato Review.*

J. W. Haney, whose farm lies just south of the river and opposite town, brought to our office nine ears of corn weighing in all 13½ pounds. One ear is 13½ inches long, another 9½ inches in circumference. The entire field will go about seventy-five bushels to the acre. How is that for drouthy Kansas?—*LeRoy Reporter.*

The Alma salt works, under charge of Mr. Wright, are now in full operation, turning out about twenty barrels of salt a day, a very pure and clean article. The brine in the new well is very strong, from 80 to 90 per cent; and as much is pumped in six hours as can be boiled down in twenty-four hours. The new well was sunk several feet deeper than the first one; and it is supposed that a solid bed of salt was penetrated. Under the new management, the salt works give every promise of being a grand success; and it is anticipated that in a short time they will be able to ship a car load a day.—*Alma News.*

Yesterday Mr. Joshua Bitner, living near Hiatville, was brought before Justice Cheney upon a State warrant, charged with importing a number of Texas cattle, from which a large number of native cattle were infected with the cattle fever, and from the effects of which they died. He gave bond in the sum of five hundred dollars for his appearance on the 2d day of September, at which time the case will be heard. This, we believe, is the first case of the kind that has been brought into the courts; and the result will be watched with more than usual interest by the farmers and public generally. The southern and western portions of the county have suffered greatly by the loss of cattle, caused by the Texas fever; and Mr. Bitner, the defendant in question, has lost a great number of his native cattle by the contagion. The question once fairly in the courts, and the laws sharply defined, may in the future put a stop to the introduction of southern cattle upon our county ranges, and give our farmers the long-desired security from the dreadful disease.—*Fort Scott Monitor.*

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 4, 1880.

H. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Horticulture in Switzerland.

[An abstract of a paper read before the Manhattan Horticultural Society, by Prof. J. D. Walters, June 17th, 1880.]

The horticulture of a country is a product of several equally important factors,—climate, soil, markets and civilization. We will consider some of these factors separately before we inquire into their result. Switzerland is in the latitude of Minnesota; and is a high table-land, bounded on the south by the Alps and on the north and west by the Jura mountains. It will be seen at once that the Swiss horticulturist cannot dine on oranges, unless he buys them from his southern neighbors in sunny Italy. In the Alps, nothing can be raised that would taste like vegetables. Pastures on the slopes, pines among the rocks, snow on the peaks, and glaciers in the gorges, are the programme. In the Jura, the lower valleys produce potatoes and cabbage, while higher up an occasional walnut tree, lonesome among the shaggy pines, ripens his scanty fruit. There are in French Switzerland well-populated towns,—I name La chaux de fonds and Locle—about which, for a dozen miles, not an onion can be grown.

But as we descend the valleys the vegetation changes. We behold a land like Kentucky rather than Minnesota. The hills are covered with dense woods of oak, beech, Austrian pine, and wild cherry. The streams are lined with meadows, the slopes bear wheat and potatoes, while the hills facing south are terraced up and sun the delicious grape.

Considering the elevation of the country and its latitude, the climate is very favorable for agriculture and fruit-raising. It is thus all over central Europe. The Gulf stream warms the northern coast of the continent, while hot Africa sends warm winds from the south; and these south winds—*fœhns*, as the Swiss call them—are not disgusting exodusters from the sandy plains of Mexico, but are warm, moist, delightful Kansas zephyrs (?). A glance on the map will show that these winds must pass the Mediterranean, which classical pond acts in more than one way as the great balance-wheel of Europe's climate.

Geologists tell us that for ages after Alps and Jura had dared to raise their venerable heads, the encircled country was the bed of a sweet-water lake. They tell us, too, that at that time it rained often and in torrents. Thus valleys and gorges were torn out in the body of the mountains, and the basin of the lake filled with the debris. Dig in the plateau wherever you please, you will find such subsoil,—often cemented together, but oftener loose and bouldery,—sometimes intercepted by strata slate, but oftener by a kind of porous limestone interwoven with fish and reptile bones. Artesian wells can, as a consequence, be bored anywhere. Just drill, and the "liquid gold" will spout. The country is dotted with lakes fed by innumerable springs and rivers; and where there is no lack of water, deep soil, a good climate, plenty of snow in the winter, and timber in abundance, there can be gardens and fields.

All the land is not rich, of course. Tilled since Julius Cæsar, much of its original fertility has vanished, and the only salvation for such land is plenty of manure. But the Swiss takes care of every morsel. You can see the gardener's son run out on the high-

way to gather up horse droppings, before the animal has trotted out of sight. For the last twenty years, factories of artificial fertilizers have sprung up in the suburbs of larger towns, and market gardeners are importing guano from Chili. An immense amount of underdraining with tile-pipes, has been done also in the last half century.

The markets of central Europe are everything the gardener could reasonably wish. A dense population, averaging two hundred inhabitants per square mile of land not covered by water or everlasting snow, requires all the food that can be produced. The import of food substances in Switzerland is equal to about eight per cent of the home production. That large farms cannot exist under such circumstances, is self-evident. The town suburbs are cut up into small garden properties of two, five or eight acres. Further out there are farms of ten, twenty or perhaps, at intervals, of forty acres, but very few larger ones. These farms contain no wood land, however. All woods, and these are not inconsiderable, belong to the government, which husbands them carefully. All timber is planted like corn with us, and cultivated until it reaches the height of four or six feet. It is then thinned out, trimmed up, and when mature cut down. Timber is cut *tabula rasa* as far as the forester, an important officer in timber husbandry, drives his stakes. The stumps are then dug up, the ground plowed and planted to potatoes for one year, and then timbered again. All timber which I have seen planted was white, red or Austrian pine. On the mountain sides this method could not be followed. The soil would wash and slide, and snow avalanches would destroy the lower timber belts and carry destruction into the valleys. On such slopes, trees are cut sparingly; and in dangerous places laws forbid the cutting of any.

Districts blessed with exceptionally good soil and other favorable factors, have the appearance of vegetable gardens. These Edens supply the mountain towns mentioned with greens. Why, in the name of common sense, these towns were built where they are, I do not know, unless it is because the lots were cheap, building material in abundance, water-power plenty, air fresh and cool, and the people determined. They live by watch-making there. All make watches, talk watches, trade watches, and know all about watches. In other districts they make ribbons; in others again, jewelry. Money is plenty when times are good; if bad, the Lord and the government provide. If garden lands could be bought at reasonable prices, I would want to be a Swiss horticulturist; but wild pasture land in the mountains is worth \$15 per acre, farm land sells for \$200, and garden grounds as high as \$500, with no chance to sponge pasturage on highways and commons for the smallest Jersey beast. In my native town, there is not a rod of fence of any kind, save a few neatly trimmed hedges for ornamental purposes. Debts are the ruin of a man there as well as here, and so the poor man must rent a place and be a slave, or come to Kansas.

Of the vegetables raised, the Irish potato is the king. It is planted and worked as everywhere, generally gives good crops, and ornaments the table of rich and poor. A portion of them are transformed into liquors, alcohol, starch, or used as pig feed. Cabbage is raised by the acre. The plants are set out with much care and fertilized several times during the summer with liquid manure. The great bulk of the cabbage goes into barrels to ferment into classic *Sauerkraut*. String beans, peas, red beets,

lettuce, etc., form the usual programme of every kitchen garden. Strawberries grow in the woods as well as in the market gardens; and the same is true of gooseberries, blackberries, and raspberries. Currants bear well; but the boss shrub is the grapevine.

The importance of grape culture will be evident from the statement that in the canton of Geneva four per cent, and in the cantons of Vaud, Neuchâtel, Zurich and Thurgau two per cent, of the grand total area is covered with wine plantages. The best location for a vineyard is the southern foot-slope of a hill, especially along sun-reflecting waters. The ground is held in place by terrace walls of roughly cut stone; and the vines are grown about five feet apart on pine poles, the extremities of which have been boiled a few moments in coal tar. With us in Kansas, terrace vineyards would not do. Switzerland records 40 foggy and 150 rainy days against the 4 thin fogs and 102 splashing rains which our meteorologists are permitted to enjoy.

Grape-raising is hard work. The plow and cultivator are not used: all is done with hoe and spade. The plantages are kept scrupulously clean of weeds. As much manure is used as can be made. It is carried up the terraces in back-baskets. The grapes are carried down in similar baskets. The varieties planted are not numerous, and mostly of a yellow, transparent color. The plants are raised in nurseries, and transplanted when three or four years old. Cutting is done so short that, in the winter when the poles are removed to sheds, strangers often wonder what the stub-fields contain.

Some grapes are dried and sold as raisins; others are jellied, or preserved for winter use; but the great bulk of them go to the press,—not the printing-press. The canton of Vaud alone produces over ten million gallons of the sparkling liquid "that gladdens the human heart," as the Hebrew sage put it. Yet, notwithstanding these enormous productions, the country imports one million francs' worth of spirituous beverages per annum. A necessary consequence of this is the liberal use of wine in the family. In the wine-producing cantons, it visits the table as regularly as milk. Everybody drinks wine; and, curious enough, they are healthy, act vigorous, and get old. Swiss wines seem to contain less alcohol and more sugar than our Missouri or California productions. They are kept unadulterated and pure, which may explain something.

Experiments have been made of late with the tomato as a substitute for the grape, so furiously attacked for the past five or ten years by the phylloxera; and if what I have read is true, they have been successful. Tomato wine is said to contain a smaller percentage of alcohol, more nourishing substances, and, if bottled, a greater amount of carbonic acid gas, than ordinary grape wine.

If horticulture in Switzerland can supply the demands of the country in any line, it is in products of the orchard. Apples, pears, cherries, prunes and plums grow in abundance, but the peach is not found extensively. The roads and railroads are lined for miles with oak-like fruit trees,—kings, every one of them. Of all kinds of fruit, the pear is the peer. There are dozens of varieties with names and dozens without names,—seedlings and grafted ones. Most of them are large, hard, winter pears that can not be eaten before Christmas. Large, arched cellars are a part of every dwelling,—a much-needed convenience every-

where. These winter varieties make the best cider, too. Many of the fall varieties ferment partly on the tree, and must be used as soon as they drop. I have eaten pears down in Leavenworth and Lawrence which were better, finer and nicer specimens than any that I ever tasted in Switzerland; but I have never seen in America orchards full of trees loaded down with fruit like those. The canton of Thurgau is perhaps the best pear country in the world, with Zurich and Aargau following.

Most every farmer has a small nursery in a corner of his garden, where he raises and grafts his own trees; or, one neighbor, more of an expert in the art, grafts for the other. Young men learn the art early. The school-books contain chapters on fruit-raising and grafting, and many of the cantons have agricultural schools and experimental stations. Thurgau, with a population of 90,100, has an industrial college, an agricultural school, and three experimental farms, managed by the state. Other cantons, however, do nothing at all for the rural arts.

Time forbids to speak of the most charming branch of our beloved art,—landscape gardening. It will be the subject of another paper. Few countries can boast of natural beauty,—of grand, sublime scenery,—like the Alpine highlands; and where a tasteful hand aids a willing nature, there can well be charm for the eye. Let me quote one passage from "A Kansan abroad." He stands on the Brunig, in the Bernese highlands, and exclaims: "Everything I saw in dreams of lofty mountains; of 'airy pinnacles that syllable men's names;' of cataracts bounding in snowy whiteness into mid-air and passing away in rainbow-tinted mist; everything I ever saw on canvas of flying clouds or azure sky; everything I imagined in waking hours of forest, dale or stream, is here."

The old parks in the suburbs of towns and monasteries have an aristocratic look,—stiff, straight and shorn,—rococo from the gate to the chapel. The trees are gigantic linden, oaks and Lombardy poplars. Modern villas are surrounded by English parks,—natural, interesting and ever-changing in aspect. The fashionable trees at present are the horse-chestnut, the platana, and the beech. Nothing can be more delightful than a summer-day ramble among the beeches, which, interspersed by an occasional oak giant, constitute the parks of many of the old castles and modern villas of the country. The shadows are so cool and deep; the belts of golden light that lie across the greensward at every opening among the trees, are so bright and sunny; the far-stretching vistas so mysterious and seductive to the imagination; and the trunks and branches of the beeches so round and well filled, and so covered with heavy masses of light green foliage,—that one feels as if in an enchanted palace of some Arabian prince.

But I must close. I should have mentioned many other subjects, to make the picture even an outline. I should have spoken of the May-bug and of its progenitor, and might have told you how, in olden times, he was summoned before the bishop of Lausanne, damned and sentenced to leave the country, and how he decided to stay, notwithstanding. I should have mentioned that apple-borers are worse over there than here, and that the cabbage-worm and the phylloxera increase in their attacks upon the products of hoe and plow with more fury every year. I have not said anything of taxes, a worse affliction than grasshoppers, chinch and potato-bugs, every time.

Every country has its dark side, and so has Kansas; but we do not hear of Kansans going abroad to stay. The fact that the United States has issued citizen papers to a half-million of Swiss tells a story. I know one chapter of it. It begins in an over-populated country town, tells of petty laws, military duties, high taxes, small wages, hard work and no hope, and ends on the broad prairies of Kansas, with liberty, plenty of space, plenty to live on, and a bright future.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 4, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Supt. A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

This morning we gathered specimens of pearl millet for exhibition, which were ten feet high.

The Messrs. Ulrich are hard at work putting in handsome stone steps at the front of the College Building.

Hon. D. B. Long, of Ellsworth, was on the Hill on Thursday. Mr. Long expects to send two of his children to College the coming term.

Prof. Platt, with a glow on his countenance which speaks of good living and good company at the Bismarck camp-meeting, reached home on Friday.

One of our old students arrived yesterday, and reports thirteen students from his (Jewell) county either on their way or coming to College next term.

Our meteorologist reports that, during one of the numerous showers of the past week, 1.32 inches of water fell in thirty minutes. How is that for drouthy Kansas!

Prof. Ward reached home yesterday, safe and sound, and well pleased with his ramble in Colorado. The Professor is as brown as a nut, and he says he feels like business.

A large number of students are already in town busily engaged in looking after board and lodgings for next term. Never before has there been such a rush of students at this season.

During the month of August, the highest temperature was 97°, and lowest 46°. Rainfall for the month, 8.51 inches, which is 4.97 inches above the average at this station for twenty years past.

Board with room in private houses, at a moderate price of from two and a half to three dollars a week, is in good demand. A note to President Fairchild will bring demand and supply together.

We insert this week the time-table of the M., A. & B. Railway. The Burlingame train connects with the A., T. & S. F., both east and west. Students and others consulting the time-tables as now published, will find them reliable.

Between spells, or rather when the rain "lets up," which is rare indeed, corn has been cut up, wheat land plowed, fruit gathered, sidewalks laid, and floors scoured and oiled. Indeed, "term-time" is upon us, and we expect to be prepared for it.

In another column, an article headed "A New Kansas Industry," gives the mode of manufacturing the New Enamelled Marble Slated Blackboards, now so deservedly popular. This blackboard we have often used, and know it to be superior to anything of the kind in the market.

Students are already gathering for the new term. Several new faces have appeared, ready to take the first opportunity for learning. Inquiries for rooms to rent and boarding places are becoming more and more frequent. Any information in this direction will be thankfully received by the President.

On Thursday we took a hasty run through the Bismarck fair-grounds, which showed the grounds and buildings in a good state of advancement, considering the very rainy weather of the past two weeks. We find the grounds very pleasant, and the buildings substantial and even elegant. The success of the fair now seems assured.

The College year opens on Thursday, Sept. 9th. At 9 o'clock A. M., students meet in the chapel, where announcements will be made and general directions given. Examinations for admission and assignment to classes, will occupy the rest of

the day. Classes will be organized, and lessons announced on Friday morning. Chapel exercises are at 8:30 A. M.

We met our old friend Gov. Salter on the train on Wednesday last, when he informed us of Lews' marriage to Miss Dora Kinsey, of Silver Lake, Kansas. This information, however, neither surprised nor shocked us; for we have all along had a suspicion that something of this kind was brewing. We can only say,—and the whole INDUSTRIALIST force joins us,—that we wish these young people all of the large measure of happiness which they deserve.

NATIONALIST ITEMS.

The public schools in this place will open on Monday next.

J. D. Haskins has sold his lumber yard to E. C. Gifford, of Clay Center.

J. F. Gardner has put up about 500 tons of hay on the divide near Gov. Harvey's. They will commence pressing it for market next week.

Mail is now sent from this post-office to all points on the U. P. R. R., both east and west, twice a day. This will be a great convenience to our people.

The Fair Association commence, immediately, the building of a covered amphitheater at the speed ring. It will accommodate a thousand persons, and will add largely to the comfort and pleasure of all attending the fair.

We hear Mrs. Dr. Clark and family are delighted with the Davidson place. We don't wonder. A summer spent on College Hill gives one such a taste of the fine scenery, air and water there, that it is hard to become reconciled to town life again. Ask Prof. Shelton how he likes living on the Hill.

We are in receipt of the catalogue of the State Agricultural College, printed at the printing department of that institution. It is beautifully executed, and contains a fund of information which every Kansan should read. Shall give it more notice soon.—*Riley Center Independent.*

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

THE NEXT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued can be seen by reference to the general course of study on the fourth page.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urgently advised to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with

the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms. Plans for giving to the library greater efficiency are already under advisement.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

Agricultural College Lands.—These lands are in the market, as provided by law, and for sale for one-eighth cash, balance in seven equal annual payments with ten per cent interest, payable annually. The lands are all choice selections, and prices range generally from \$5.00 to \$6.25 per acre. Some of the best tracts are appraised at from \$8 to \$10 per acre, and they are well worth the money. These lands are located in Washington, Marshall, Clay, Riley and Dickinson counties. For particulars, maps and descriptions, address L. R. Elliott, Agent, Manhattan, Kas.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY. KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

Nos. 1 and 2 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. W. N. ROSE, President.

MISS LIZZIE COX, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

M. A. REEVE, President.

WIRT S. MYERS, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations. G. H. FAILYER, President.

D. S. LEACH, Secretary.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering. Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange is sued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 4, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry, Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or House- hold Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hood crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, to make one a master of his mother-tongue, a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE,

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37ff.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected summer stock on hand. Opposite post-office, Manhattan. 11-26

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange is sued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Instrumental Music.—Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three. Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught. For terms, see heading "Expenses" in article entitled, "The Next College Year."

THE INDUSTRIALIST



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MANHATTAN, KANSAS, SATURDAY, SEPTEMBER 11, 1880.

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Address A. A. STEWART, Manhattan, Kas.

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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

From the *Kansas Farmer*.

The List of State Fairs.

We publish this week a list of the fairs to be held in the State of Kansas this fall. The list is as complete as can be made, some of the counties not having reported to the State Board of Agriculture. We have had a great deal of inquiry for this list, which shows that much interest exists regarding the fairs of the State:—

Arkansas Valley Agricultural Society, Wichita, Sept. 28, 29, 30, and Oct. 1.
Allen County Agricultural and Mechanical Association, Iola, no fair.
Anderson County Fair Association, Garnet, no fair.
Atchison Industrial Exposition and Agricultural Fair Association, Atchison, at Atchison, Sept. 6 to 12.
Brown County Agricultural, Horticultural and Mechanical Association, Hiawatha, Sept. 28 to Oct. 1.
Butler County Exposition and Horticultural Society, Augusta, no fair.
Burlingame Union Agricultural Society (Osage Co.), Burlingame, at Burlingame, Sept. 20, 21, 22 and 23.
Central Kansas Fair Association, (Barton) Great Bend, no report received.
Cherokee County Agricultural and Stock Association, Columbus, at Columbus, Sept. 22, 23 and 24.
Cloud County Agricultural and Mechanical Association, Concordia, no exhibition.
Crawford County Agricultural Society, Girard, at Girard, Sept. 7, 8 and 9.
Dickinson County Agricultural Society, Abilene, at Abilene, Oct. 13, 14, 15 and 16.
Doniphan County Agricultural, Horticultural and Mechanical Association, Troy, at Troy, Sept. 28, 29, 30, and Oct. 1.
Ellis County Agricultural Society, Hays City, no fair.
Ellsworth County Agricultural Society, Ellsworth, no date stated.
Franklin County Agricultural Society, Ottawa, at Ottawa, Sept. 29, 30, and Oct. 1 and 2.
Greenwood County Agricultural Society, Eureka, at Eureka, Oct. 6, 7 and 8.
Harper County Agricultural and Mechanical Association, Anthony, no report received.
Harvey County Agricultural Society, Newton, at Newton, Sept. 29, 30, and Oct. 1.
Humboldt Agricultural and Mechanical District Association, ———, ———.
Jackson County Agricultural and Mechanical Association, Holton, at Holton, Sept. 7, 8, 9 and 10.
Jefferson County Agricultural and Mechanical Association, Oskaloosa, at Oskaloosa, Sept. 28, 29, 30, and Oct. 1 and 2.
Jewell County Agricultural and Industrial Society, Mankato, no report received.
Johnson County Agricultural and Mechanical Association, Olathe, no report received.
Kansas Valley Fair Association, (Douglas Co.) Lawrence, no fair.
Kansas Central Agricultural Society, (Davis Co.) Junction City, at Junction City, Oct. 5, 6, 7 and 8.
Labette County Agricultural Society, Oswego, at Oswego, Sept. 14, 15, 16 and 17.
Lincoln County Agricultural Society, Lincoln, no fair.
Linn County Agricultural Society, LaCygne, at LaCygne, Sept. 28, 29, 30, and Oct. 1.
Linn County Agricultural and Mechanical Association, Mound City, at Mound City, Sept. 28, 29, 30, and Oct. 1.
Lyon County Agricultural Society, Emporia, at Emporia, Sept. 7, 8, 9, 10 and 11.
Marion County Agricultural Society, Peabody, at Peabody, Sept. 21, 22 and 23.
Marshall County Agricultural Society, Marysville, at Marysville, Sept. 21, 22, 23 and 24.
McPherson Park Association, McPherson, Oct. 12, 13 and 14.
Miami County Agricultural and Mechanical Association, Paola, at Paola, Sept. 29, 30, and Oct. 1, 2.
Montgomery County Agricultural Society, Independence, at Independence, Sept. 30, and Oct. 1 and 2.
Morris County Agricultural Society, Parkerville, at Parkerville, Sept. 20, 21 and 22.
Morris County Exposition Company, Council Grove, at Council Grove, Oct. 5, 6, 7 and 8.
Neosho Valley District Fair Association, Neosho Falls, at Neosho Falls, Sept. 20, 21, 22, 23, 24 and 25.
Northwestern Agricultural and Mechanical Association, (Mitchell), Asherville, no report received.

Norton County Agricultural Society, Leota, no report received.

Osborne County Agricultural Society, Bloomington, no date selected.

Ottawa County Agricultural and Mechanical Institute, Minneapolis, at Minneapolis, Sept. 22, 23, 24 and 25.

Pawnee County Agricultural Society, Larned, no fair.

Phillips County Agricultural and Mechanical Association, Phillipsburg, at Phillipsburg, Sept. 14, 15 and 16.

Pottawatomie County Agricultural Society, St. George, no fair.

Reno County Joint-Stock Agricultural Society, Hutchinson, at Hutchinson, Sept. 22, 23, 24 and 25.

Reno County Horticultural Society, Hutchinson, no report received.

Riley County Agricultural Society, Manhattan, at Manhattan, Sept. 28, 29, 30, and Oct. 1.

Republic County Agricultural Society, ———, ———.

Russell County Agricultural and Mechanical Association, ———, ———.

Sedgwick County Agricultural, Mechanical and Stock Association, Wichita, at Wichita, Sept. 14, 15, 16 and 17.

Seventh Judicial District Agricultural and Horticultural Society, (Neosho Co.) Chanute, at Chanute, Sept. 29 to Oct. 2.

Shawnee County Agricultural Society, Topeka, at Topeka, Oct. 5, 6, 7 and 8.

Smith County Agricultural and Mechanical Association, Smith Center, ———.

Spring River Valley Agricultural, Horticultural, Mechanical and Stock Association, (Cherokee Co.) Baxter Springs, no fair.

Valley Falls, Kansas, District Fair Association, (Jefferson Co.) Valley Falls, at Valley Falls, Sept. 21, 22, 23 and 24.

Walnut Valley Fair Association, Winfield, no date stated.

Wabaunsee County Agricultural Society, Alma, no fair.

Washington County Agricultural Society, Washington, at Washington, Sept. 16, 17 and 18.

Wilson County Agricultural Society, ———, ———.

Woodson County Agricultural Society, Yates Center, not decided.

Western National Fair Association, Bismarck Grove, Douglas Co., Sept. 13 to 18.

Another Kansan Abroad.

They were in Highlands, a colony founded on a plateau four thousand feet above sea-level, by S. T. Kelsey, a fruit-grower from Kansas,—one of those sanguine, vivid, shrewd men who have founded American towns. He chose this Blue Ridge plateau for his enterprise because he believed the climate to be more healthful and the soil better adapted to fruit-growing than any in the country, drove his wagon into the unbroken wilderness, and began to build his house in certain faith in the future. When our friends visited him, the village contained but two or three other houses; and there was something pathetic as well as comic in the gravity with which the next day he led them through the dense woods, frightening the squirrels as he pointed out "Main Street," "Laurel Avenue," and the sites for the town-hall and churches. But since then the streets have been opened, a house for a church and school, mills and shops, have been built, and about twenty energetic families have gathered around this working centre.—*Harper's Magazine*.

Many Kansans will remember the subject of the above sketch, who some seven or eight years ago, if we remember right, was prominent in the horticultural affairs of this State. We believe that he was forester of the A., T. & S. F. R. R. Co.

How Ice is Made in New Orleans.

An account from that city tells us that the first thing one notices on entering the freezing room of the factory is the intense cold, then the small heaps of snow lying around, and at last the shining mass of solid ice, made up of blocks 16 feet high, 30 long, and over a foot thick. These immense cakes are frozen on plates of steel which are hollow pipes containing the freezing agent,

ammonia, running through them. The water falls in drops from the roof, and freezes as it falls, thus forming immense blocks. In another freezing room the sight was beautiful beyond description, unnumbered columns of ice 60 feet high on a frozen floor, while from above came splashing drops of water, falling as steadily as summer rain. These icicles surround hollow iron columns through which the ammonia passes, and freezes the falling water that comes from the roof. The icicles in a week or two unite, and in a little longer time they form a solid block of ice 2,000 tons weight. This is then cut by ice plows and saws into blocks fit for sale. The mode of making ice is this: Liquor ammonia is placed in two boilers which are heated by steam. Steam pipes are used for heating the boilers, because it is necessary to keep the temperature uniform and steady. The effect of the heat is to generate ammonia gas, which passes from the boilers into a dryer, where all remaining moisture is removed. From the dryer the gas passes to a condenser, where it is subjected to a pressure sufficient to transform it into a liquid. The liquid is conveyed, still by pressure, to the columns and pipes in the freezing rooms. Released from pressure, the liquid again becomes gas, and expands to 2,300 times its former volume. The sudden expansion absorbs the heat, which is carried off with the gas to those pipes on the roof of the building, where it is mixed with water and carried back to the boilers, to go over the same process.—*Anglo-American Grocer*.

Population.

The population of the State of Kansas, June 1st, 1880, as returned by the U. S. Supervisors to the Auditor of the State, for the tenth census of the United States:—

Allen.....	11,463	Lincoln.....	8,586
Anderson.....	8,991	Linn.....	15,326
Arapahoe.....	3	Lyon.....	17,379
Atchison.....	26,488	Marion.....	12,474
Barbour.....	2,661	Marshall.....	16,147
Barton.....	10,326	McPherson.....	17,145
Bourbon.....	20,518	Meade.....	296
Brown.....	12,830	Miami.....	17,806
Buffalo.....	191	Mitchell.....	14,917
Butler.....	18,591	Montgomery.....	18,124
Chase.....	6,089	Morris.....	9,228
Chautauqua.....	11,078	Nemaha.....	12,468
Cherokee.....	22,075	Neosho.....	15,136
Cheyenne.....	87	Ness.....	3,322
Clay.....	12,320	Norton.....	7,004
Clark.....	163	Osage.....	19,654
Cloud.....	15,348	Osborne.....	12,472
Coffey.....	11,456	Ottawa.....	10,325
Comanche.....	372	Pawnee.....	5,349
Cowley.....	21,561	Phillips.....	12,042
Crawford.....	16,642	Pottawatomie.....	16,347
Davis.....	6,996	Pratt.....	1,890
Decatur.....	4,180	Rawlins.....	1,626
Dickinson.....	15,261	Reno.....	12,776
Doniphan.....	14,264	Republic.....	14,945
Douglas.....	21,773	Rice.....	9,297
Edwards.....	2,419	Riley.....	10,428
Elk.....	10,665	Rooks.....	8,062
Ellis.....	6,183	Rush.....	5,498
Ellsworth.....	8,529	Russell.....	7,357
Footo.....	411	Saline.....	13,861
Ford.....	3,123	Scott.....	43
Franklin.....	16,852	Sedgwick.....	18,928
Gove.....	1,197	Sequoyah.....	568
Graham.....	4,262	Seward.....	5
Grant.....	10	Shawnee.....	29,120
Greeley.....	3	Sheridan.....	1,574
Greenwood.....	10,560	Sherman.....	9
Harker.....	21,139	Smith.....	13,904
Hamilton.....	68	Stafford.....	4,768
Harvey.....	11,478	Stanton.....	5
Hodgeman.....	1,708	Stevens.....	12
Jackson.....	10,722	Sumner.....	20,944
Jefferson.....	15,574	Thomas.....	161
Jewell.....	17,524	Trego.....	2,535
Johnson.....	16,658	Wabaunsee.....	8,761
Kansas.....	9	Wallace.....	686
Kearney.....	159	Washington.....	14,825
Kingman.....	3,730	Wichita.....	14
Labette.....	22,753	Wilson.....	12,764
Lane.....	634	Woodson.....	6,539
Leavenworth.....	32,345	Wyandotte.....	19,152

Total..... 996,296

First Congressional District..... 399,923
Second Congressional District..... 256,336
Third Congressional District..... 440,037

Total..... 996,296

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 11, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

The Education of Fairs.

Among the stimulants to progress in all the arts of civilization, the annual fair has come to take an important place. It is one of our institutions, in all the gradations through township, county, state and national to international, as much a part of enlightenment as our systems of schools. Yet there has been all the way along their brief history a struggle between the mere holiday of show and jollity, and the strict comparison of good with better and best for the improvement of all. The fair as a speculation has proved most successful when it most nearly resembled a first-class menagerie,—circus and all. It has most elevated the tone of industrial arts when, with less excitement, the interest of the people has gathered about the genuine products of arts. Then the fair has taken high rank in the work of education for the masses.

Such fairs prove admirable means of information to all classes of people. Their array of products, machinery, and methods, forms the best of object lessons. No child can wander through the maze of agricultural machinery that almost every fair collects, without learning more of the possibilities in farming than any amount of study alone, or individual experience alone, could give him. This truth is still more evident in the products of the soil. Grains, fruits and vegetables have a far more definite and emphatic place in the world to one who has been able to compare and study directly the endless variety that appears upon his first glance over horticultural hall. In this mere superficial study, one gets some idea of a larger world than that of his thoughts, and is led on to more thorough inquiry. Then follows an exchange of opinions and a study of methods and contrivances. Inquiry, once awakened, is quick to find new lessons in what passes under observation. "How is that done?" becomes the question of every new-comer.

In answering such questions, our ordinary fairs do less than they might. Plain labels upon all products, could give to a real student a great amount of information that now is sought in vain. How many of us have peeped through the cracks of stall after stall to catch a glimpse of famous horses, only to wonder if this bay or that black has any wide reputation. A mammoth pumpkin or squash, about which some general facts are given, has tenfold more interest than a fine collection of vegetables, about which one can scarcely learn the owner's name.

But we all learn more than the simple facts of experience in other ways: we learn to so compare labors as to appreciate values. Though the fair has lost its old significance as a market place,—once its only purpose,—it is still a place for comparison of utilities and efforts. Out of this come truer ideas of value, and a more general adjustment of standards for estimating worth. Good work has its average price; but what is good work varies with times and localities.

Then what a fund of information every child brings home from the fair about the manners and habits of his fellow-men. The well-bred learn the importance of their breeding, and the ill-bred learn in some degree to see themselves as others see them. Historians are wont to credit the Crusades of the middle ages with a renovation of manners and customs throughout Europe, and explain

the fact by showing how persons of all ranks and of all nationalities met upon common footing and exchanged civilities. Upon a small scale, our fairs bring high and low together, to the advancement of both.

But all this varied information is but a small portion of the real education given by well-regulated fairs. More comes in the way of suggestion to the quick intelligence of youth. Your boy comes from the fair full of inventive spirit. His talent for mechanical device is awakened, and farm implements have to undergo experiments for improvement. The mammoth squash, raised by peculiar manuring and tillage, suggests a new application to melons and cucumbers. The uncouth manners of the clown and the self-composure of the gentleman, both help to an intelligent and manly self-control. So every part of the machinery of agriculture takes a step forward with its master. The whole history of improved agriculture is made up of such short steps; but more and longer ones have come since agricultural fairs have gained a place in our machinery of education. Everywhere they ought to be a stimulant to better work and better life. They ought to open up new fields of ambition for every farmer. They ought to show him how *thinking* makes his calling grow in importance and influence. They ought to awaken a desire for living above mere existence, mere sustenance of human animals, even above mere accumulation of houses, lands, or wealth of stock or products. Comparison of ways and means of better life ought to bring a more generous regard for human interests, and a stronger sympathy for neighbors.

If, now, the fairs that follow faintly the great State gathering at Bismarck Grove, can find this noble aim a place in every case,—excluding betting pools and drinking shops, with all those low devices for stealing the pennies of youth and tickling the appetite for gambling or drink, so common at such gatherings,—we may feel that they have paid their cost in education, and so are a success, even though the treasures may be leaner than some whose ways are past finding out.—*President Fairchild.*

The Agricultural College Exhibit at Bismarck Grove.

The College exhibits at the Western National Fair, held at Bismarck Grove, a herd of cattle numbering eleven head, in which three breeds, Short-horns, Jerseys, and Galloways, are represented; a small herd of Berkshire swine; and, in the main exhibition building, a collection of grasses, "tame" and native; a collection of woods; a collection of those minerals with which agriculture has to deal; specimens of work done by the Mechanical Department; drawing from the Department of Drawing; and specimens of the work of the class in Book-keeping.

This exhibition is not made for the purpose of competition, but solely with the object of placing before the visitors at the fair, something of the work of the several departments of the College.

In this article we shall endeavor to give a brief account of the different articles of the College exhibit, which may prove of use to those of our readers who have not the privilege of visiting Bismarck.

THE STOCK.

First as to the Short-horns. These, numbering nine head, are with three exceptions members of the "Grace Young" branch of the "Young Mary" family. It will be noticed that the Short-horns are in rather better than good condition; but this must be credited to the excellence of our native and tame pastures, from which the flesh has

been made. The whole herd has been in the pastures until three weeks ago, since when, for the purpose of improving the hair, it has been kept up during the heat of the day. In addition to the "Young Marys" mentioned, we have a representative of the "Constance" family in the young bull (a two-year-old Sept. 16th) "Prince Constant," 36546, and two descendants of imported "Cherry Pie" by "Lord of the North" (11743), in "Cambridge Jubilee" and calf, two animals very rich in Booth blood. The

HALF-BRED GALLOWAY HEIFER

is worthy of careful study. She is by a pure-bred Galloway bull, her dam being a pure Short-horn cow now on exhibition at the fair. It will be seen that she has the general Short-horn form and the Galloway size and handling; and, although her sire is hornless, yet the horns on this heifer are a much more pronounced character than in her dam. It has seemed to us that this experiment furnishes another fact showing the danger of attempting to couple animals having widely divergent characters, as in the parents of this cross-bred heifer.

We have at Bismarck only two

JERSEYS;

and these we think show, in a marked degree, the strong milking characters of this excellent dairy race.

Our exhibit of

SWINE,

though not a large one, will be found to show many points of interest. In particular, breeders of Berkshires will be interested in the four-year-old boar "Mahomet" 1979, bred by Wm. Hewer, Sevenhampton, England. Mahomet has proved a most valuable sire, as many of the excellent show animals exhibited by Mr. Rollins, Mr. Gentry, and ourselves, will testify. The two pens of spring pigs on exhibition by the College are by "Mahomet," out of high-bred "Sallie" sows.

In the corridor of the south wing of the main exhibition building, will be found the miscellaneous College exhibit of grasses, chemicals, woods, etc. In another place will be found an accurate description of the grasses on exhibition. We desire here to call attention only to a few of those which may be said to be passing through the experimental stage of culture in this State. First we wish to mention

RICE CORN,

which has done exceedingly well with us. We are satisfied that too much has not been said for its productiveness and ability to withstand drouth. But it seems to be peculiarly attractive to birds; and from this cause our crop has suffered severely. The

PEARL MILLET

on exhibition is a portion of a very heavy crop grown on the College farm. This millet has with us endured the attacks of chinch-bugs and the very dry weather of this season, apparently sustaining no injury from either. We shall try it upon a considerable scale another year. A considerable bunch of

SOUTHERN COW PEAS

is also shown. Of these, about one acre has been grown the present season. The yield of fodder has been very heavy. We are confident that cow peas can be grown in Kansas as well as in Mississippi. They seem to us to be especially valuable for hog pastures. The

CHARTS,

one showing the four crops of alfalfa hay cut the present season from the same land and a part of the roots on which this crop grew, and the other giving the common grasses which go to make prairie hay, will prove interesting and instructive.—*Prof. Shelton.*

Minerals of Agriculture.

At the Bismarck Fair, the Chemical Department of the College exhibits the minerals of agriculture. In this collection are shown chemical elements, the principal minerals from which soils are formed, and the principal mineral fertilizers. It is intended as an object lesson in the chemistry of the soil. There are forty-four specimens displayed in inverted show bottles. Upon the label is given the name of the mineral, and, in smaller type, the elements which it supplies to the soil and through the soil to the crop. The chemical elements constituting each mineral species are arranged in the order of their supposed value, as determined by abundance in the mineral and importance and abundance in soils.

For reference, the list is given below:—

OXYGEN.
CARBON.
NITROGEN.
SULPHUR.
PHOSPHORUS.
CHLORINE.
HYDROGEN.
CARBONIC ACID. *Carbonic Anhydride.* Supplies carbon, oxygen.
QUARTZ. Supplies silicon, oxygen.
FERRIC OXIDE. Supplies iron, oxygen.
CALCIC CARBONATE. (*Limestone, Calc Spar, etc.*) Supplies calcium, carbon, oxygen.
FELDSPAR. Supplies potassium, calcium, sodium, silicon, aluminum.
MICA. Supplies potassium, calcium, magnesium, sodium, iron, silicon, aluminum, oxygen.
GRANITE. (*Quartz, Feldspar, Mica.*) Supplies potassium, calcium, magnesium, sodium, iron, silicon, aluminum.
ALUMINA. Supplies aluminum, oxygen.
TALC. Supplies magnesium, silicon, iron, oxygen.
SERPENTINE. Supplies magnesium, silicon, iron, oxygen.
HORNBLEND. Supplies potassium, calcium, magnesium, sodium, iron, silicon, aluminum.
GYPSUM. *Calcic Sulphate.* Supplies calcium, sulphur, oxygen.
ALUMINIC SILICATE. (*Pure clay.*) Supplies aluminum, silicon, oxygen.
SODIC SILICATE. Supplies sodium, silicon, oxygen.
ZEOLITES. Supply potassium, sodium, calcium, silicon, aluminum.
MAGNETIC CARBONATE. *Magnetite.* Supplies magnesium, carbon, oxygen.
FERROUS SULPHATE. Supplies iron, sulphur, oxygen.
CHILI SALT-PETER. *Sodic Nitrate.* Supplies nitrogen, sodium, oxygen.
SALT-PETER. *Potassic Nitrate.* Supplies potassium, sulphur, oxygen.
AMMONIC NITRATE. Supplies nitrogen, oxygen, hydrogen.
AMMONIC SULPHATE. Supplies nitrogen, sulphur, oxygen, hydrogen.
LIME. *Calcic Hydrate.* Supplies calcium, oxygen, hydrogen.
COMMON SALT. *Sodic Chloride.* Supplies sodium, chlorine.
MAGNETIC SULPHATE. Supplies magnesium, sulphur, oxygen.
SODIC SULPHATE. Supplies sodium, sulphur, oxygen.
AMMONIC CARBONATE. Supplies nitrogen, carbon, oxygen, hydrogen.
AMMONIC CHLORIDE. Supplies nitrogen, chlorine, hydrogen.
POTASSIC SULPHATE. Supplies potassium, sulphur, oxygen.
POTASSIC CARBONATE. Supplies potassium, carbon, oxygen.
SODIC CARBONATE. Supplies sodium, carbon, oxygen.
MAGNETIA. *Magnetic Oxide.* Supplies magnesium, oxygen.
BONES. Supply phosphorus, calcium, nitrogen, carbon, oxygen, hydrogen.
BONE ASH. Supplies phosphorus, calcium, carbon, oxygen.
BONE PHOSPHATE. Supplies phosphorus, calcium, oxygen.
SUPERPHOSPHATE. (*Prepared Fertilizer.*) Supplies phosphorus, nitrogen, calcium, sulphur.
WOOD ASHES. Supply potassium, calcium, sodium, magnesium, iron, chlorine, silicon, phosphorus, sulphur.
LEACHED ASHES. Supply calcium, magnesium, iron, silicon, phosphorus, sulphur.

The Show of Grasses.

The collection of grasses exhibited by the Horticultural Department includes the most common and valuable of the late flowering kinds, native and cultivated. Some of these enter largely into the formation of the pastures and meadows of Kansas. Among these the following kinds are conspicuous: Indian grass, blue stem, tall panic-grass, broom grass, tall muskit-grass, gramma grass,

Kentucky blue-grass, Italian rye-grass, orchard-grass, and timothy. In wooded pastures the reed grass, tall reedtop, the river and the wood drop-seed grasses, the wood saw-grass, grow, and are generally eaten readily by stock, although furnishing in the main grazing of indifferent quality. Some of the species shown are well-known weeds in lawns, gardens and fields, becoming especially prominent in late summer. These are the sand-bur, garden finger-grass, hair grass (two kinds), barn-yard grass, foxtail, and garlic grass. A few are cultivated for fodder or forage; as, Hungarian, guinea-corn, German millet, cat-tail millet. The list of grasses shown includes the following species and others:—

SAW GRASS; or, CUT GRASS. *Leersia Oryzoides*. Swampy land.
WOOD SAW-GRASS. *Leersia Virginica*. Damp wood.
RUSH GRASS. *Vilfa vaginiflora*. Dry grounds.
DROP-SEED GRASS. *Sporobolus cryptandrus*. Low grounds.
REED GRASS. *Cinna arundinacea*. Sandy woods.
RIVER DROP-SEED GRASS. *Muhlenbergia glomerata*. River banks.
WOOD DROP-SEED GRASS. *Muhlenbergia sylvatica*. Damp shades.
TIMOTHY. *Phleum pratense*. Native of Europe.
SMOOTH FINGER-GRASS. *Paspalum laeve*. Low grounds.
HAIR GRASS; TICKLE GRASS. *Panicum capillare*. Cultivated grounds.
TALL PANIC GRASS. *Panicum virgatum*. Prairies.
GARDEN FINGER-GRASS. *Panicum sanguinale*. Cultivated grounds.
BARN-YARD GRASS. *Panicum Crus-galli*. Moist grounds.
FOXTAIL GRASS. *Setaria glauca*. Introduced from Europe and Asia.
HUNGARIAN GRASS. *Setaria Italica*. Introduced from Europe.
GERMAN MILLET. *Setaria Germanica* (?). Native of Europe.
CAT-TAIL OF PEARL MILLET. *Penicillaria spicata*. Native of India.
SAND-BUR GRASS. *Cenchrus tribuloides*. Light soils.
TALL REDTOP. *Tricuspis sesterioides*. Bottoms; river banks.
ORCHARD-GRASS. *Dactylis glomerata*. Cultivated; native of Europe.
GARLIC GRASS. *Eragrostis pectinacea*. Fields and yards.
DIANDROUS WOOD-GRASS. *Diarrhena Americana*. Damp woods.
BROAD-FLOWERED GARLIC GRASS. *Eragrostis megastachya*. Fields and gardens.
HAIR GRASS. *Eragrostis capillaris*. Cultivated grounds.
RIVER HAIR-GRASS. *Eragrostis tenuis*. Sandy river shores.
WIRE GRASS. *Poa compressa*. Dry soils.
KENTUCKY BLUE-GRASS. *Poa pratensis*. Lawns and pastures.
UNION GRASS. *Uniola latifolia*. Damp shades.
WILD RYE. *Elymus Canadensis*. River banks.
WILD RYE. *Elymus species* (?). Shaded river banks.
ITALIAN RYE-GRASS. *Lolium Italicum*. Cultivated; native of Europe.
"NATCHENNY" GRASS. *Eleusine coracana*. Cultivated; native of India.
SLOUGH GRASS. *Spartina cynosuroides*. Wet grounds.
TALL MUSKIT GRASS. *Bouteloua curtipendula*. Prairies.
GRAMMA GRASS; HAIRY MUSKIT GRASS. *Bouteloua hirsuta*. Dry land.
HARDY PAMPAS GRASS. *Erianthus Ravenne*. Native of southern Europe.
BLUE STEM. *Andropogon furcatus*. Prairies.
BROOM GRASS. *Andropogon scoparius*. Dry land.
INDIAN GRASS. *Sorghum nutans*. Native of India.
BUFFALO GRASS. *Buchloe dactyloides*. High prairies.

Woods at the Fair.

The collection of woods exhibited by the Horticultural Department contains, besides some foreign specimens, the following well-known woods of this country. The list includes, with the common name, the botanical name and the common place of growth, or *habitat*:—

BLACK or WATER ASH. *Fraxinus sambucifolia*. Northern States.
BLUE ASH. *Fraxinus quadrangulata*. Central States.
WHITE ASH. *Fraxinus Americana*. Northern States.
GREEN ASH. *Fraxinus viridis*. Northern States.
PAPER or CANOE BIRCH. *Betula papyracea*. Northern U. S.
YELLOW or GRAY BIRCH. *Betula lutea*. Northern U. S.
AMERICAN WHITE BIRCH. *Betula alba*, var. *populifolia*. Eastern States.
BLACK or SWEET BIRCH. *Betula lenta*. Northern and Eastern States.

RED or SLIPPERY ELM. *Ulmus fulva*. Eastern U. S.
AMERICAN or WHITE ELM. *Ulmus Americana*. Northern U. S.
PIGNOT HICKORY. *Carya porcina*. Northern U. S.
BITTER-NUT HICKORY. *Carya amara*. Northern U. S.
SMALL-FRUITED HICKORY. *Carya microcarpa*. Central U. S.
SHELLBARK or WHITE HICKORY. *Carya alba*. Northern U. S.
SILVER or SOFT MAPLE. *Acer dasycarpum*. Central and Western U. S.
RED or SWAMP MAPLE. *Acer rubrum*. Northern U. S.
SUGAR or ROCK MAPLE. *Acer saccharinum*. Northern U. S.
BLACK SUGAR MAPLE. *Acer saccharinum*, var. *nigrum*. Northern U. S.
ASH-LEAVED MAPLE; BOX-ELDER. *Negundo aceroides*. Central and Western U. S.
RED OAK. *Quercus rubra*. Northern U. S.
SCARLET OAK. *Quercus coccinea*. Northern U. S.
SWAMP WHITE OAK. *Quercus bicolor*. Eastern U. S.
CHESTNUT OAK. *Quercus Prinus*. Central and Southern U. S.
WHITE OAK. *Quercus alba*. Northern U. S.
BUR OAK; OVER-CUP OAK. *Quercus macrocarpa*. Central and Western States.
WHITE PINE. *Pinus strobus*. Northern U. S.
AUSTRIAN PINE. *Pinus Austriaca*. Native of Europe.
GRAY or NORTHERN SCRUB PINE. *Pinus Banksiana*. Northern U. S.
BALSAM POPLAR. *Populus balsamifera*. Northern U. S.
SILVER-LEAF POPLAR. *Populus alba*. Native of Europe.
DOWNY POPLAR. *Populus heterophylla*. Central U. S.
BLACK WILLOW. *Salix nigra*. Central U. S.
WHITE WILLOW. *Salix alba*. Introduced from Europe.
SASSAFRAS. *Sassafras officinale*. Northern and Central U. S.
SMOOTH SUMAC. *Rhus glabra*. Eastern U. S.
OHIO BUCKEYE. *Aesculus glabra*. Central U. S.
BLACK WALNUT. *Juglans nigra*. Western States.
RED CEDAR. *Juniperus Virginiana*. Central and Western States.
HACKBERRY. *Celtis occidentalis*. Eastern U. S.
HONEY LOCUST. *Gleditsia triacanthus*. Central U. S.
REDBUD. *Cercis Canadensis*. Central U. S.
CHESTNUT. *Castanea vesca*. Eastern U. S.
COMMON or BLACK LOCUST. *Robinia pseudacacia*. Central U. S.
APPLE. *Pyrus malus*. Cultivated; native of Europe.
PEAR. *Pyrus communis*. Cultivated; native of Europe.
PEACH. *Persica vulgaris*. Cultivated; native of Persia.
FROST GRAPE. *Vitis cordifolia*. Northern U. S.
COMMON CHERRY. *Prunus cerasus*. Cultivated; native of Europe.
SIBERIAN CRAB. *Pyrus prunifolia*. Native of Siberia.
RED MULBERRY. *Morus rubra*. Central U. S.
FLOWERING DOGWOOD. *Cornus florida*. Eastern U. S.
BALD CYPRESS. *Taxodium distichum*. Southern U. S.
WHITE SPRUCE. *Abies alba*. Northern U. S.
LARGE-TOOTHED ASPEN. *Populus grandidentata*. Northern U. S.
POISON IVY. *Rhus Toxicodendron*. Northern and Central U. S.
SOUR or BLACK GUM. *Nyssa multiflora*. Central U. S.
AMERICAN ARBOR-VITAE. *Thuja occidentalis*. Northern U. S.
AMERICAN LARCH. *Larix Americana*. Northern U. S.
BLACK SPRUCE. *Abies nigra*. Northern U. S.
OSAGE ORANGE; BOIS D'ARC. *Maclura aurantiaca*. Southwestern States.
CHINESE TREE OF HEAVEN. *Ailantus glandulosa*. Introduced from Asia.
AMERICAN HOP-HORNBEAM. *Ostrya Virginica*. Northern U. S.
HEMLOCK SPRUCE. *Abies Canadensis*. Northern U. S.
COFFEE BEAN. *Gymnocladus Canadensis*. Central U. S.
HERCULES' CLUB. *Aralia spinosa*. Central U. S.
AMERICAN PLANE; SYCAMORE. *Platanus occidentalis*. Northern and Western U. S.
HORNBEAM; BLUE BEECH. *Carpinus Americana*. Eastern U. S.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 11, 1880.

At the time of going to press, this Wednesday afternoon, 185 students have been enrolled.

The Library is increased by addition of the Annual Report of the Chief of Engineers, U. S. A., for 1879.

We have received complimentary tickets and premium list of the Shawnee County Agricultural Fair, to be held at Topeka, Oct. 5th to 8th, 1880. The premiums offered are very liberal, and competition is open to the world. Among the attractions is an address by Hon. Stewart L. Woodford, of New York.

The Horticultural Department has received a few very handsome specimens of the potato known as "Breese's King of the Earlies," grown by the father of Sup't Graham, Mr. D. N. Graham, Abingdon, Illinois.

The College is under obligations for catalogues received from Johns Hopkins University, Baltimore, Md.; University of Rochester, New York; Syracuse University, New York; Texas Agricultural and Mechanical College; Hampton Normal and Agricultural Institute, Virginia; and Kansas State Normal School.

Necessary work in connection with the exhibit made by the College at Bismarck, and increased duties from dividing classes to accommodate the multitude of students, have delayed the issue of this number of the INDUSTRIALIST to Wednesday the 15th, and prevent entirely the issue on the 18th. After the fair we shall recover our promptness, and greet you every Saturday.

Ninety-seven new students have thus far appeared for examination, thirty-four of whom are ladies. The average of their ages is something over eighteen years. Twenty-five have no means of support but their own exertions. Seventy-two are from farmers' families; and four only are children of lawyers and doctors. Three are from other States, the rest from twenty-nine different counties of Kansas. Twenty-nine expect to take the full course of four years; the rest give their course undecided or partial.

A number of reliable Websters met in the new hall, on Saturday evening, Sept. 11th, for the first time this College year, with President Reeve in the chair. Devotion by Mr. Kern. Election of officers being next in order, the following persons were elected by acclamation, for the ensuing year: President, Warren Knaus; Vice-President, W. S. Myers; Secretary, S. C. Mason; Recording Secretary, Geo. F. Thompson; Treasurer, E. V. Cripps; Librarian, J. C. Allen; Marshal, M. A. Reeve; Board of Directors, M. A. Reeve, Geo. F. Thompson, E. V. Cripps, D. S. Leach, and S. C. Mason; Reporter, Mr. Mason; Critic, Mr. Leach. Extemporaneous speaking was entertaining. Mr. C. E. Wood presented a very excellent historical paper on the Webster Society. The Reporter, by Mr. Mason, was carefully prepared and well edited. Mr. Reeve entertained the Society with select reading. W. Knaus was appointed editor of the Reporter in two weeks. Those on duty next meeting are: select reading, C. E. Wood; composition, E. V. Cripps; declamation, Mr. Corey. Question for debate: "Resolved, That the office of County Superintendent of Public Instruction is an unnecessary expense to the county." Affirmative, Hollenberg and Cripps; negative, Paine and Leach. To new students, especially, we say come and see us. W. K.

The Alpha Beta Society held its first session for the year, Friday afternoon. The meeting was called to order by J. Copley. Devotion by Mr. Allis. W. J. Jeffery and Miss Grace Parker were elected President and Secretary pro tem. The Society then proceeded to elect officers for the ensuing term, and showed much wisdom in selecting the following: President, Wm. J. Lightfoot; Vice-President, F. M. Jeffery; Recording Secretary, Miss D. Mason; Corresponding Secretary, Miss Grace Parker; Marshal, E. H. Kern; Treasurer, B. L. Short; Librarian, Miss Anna Hunt; Board of Directors, Messrs. J. T. Willard, E. H. Kern, W. E. Whaley, J. Copley, Misses D. Mason, May Quinby, and Ida Cranford. The names of Phoebe Haines, Hattie Blades, Clara Sampson, Amy Noyes, Messrs. Henry Cottrell and George Shanks were proposed for membership. Misses Cora Hunting and Ella Mackey were initiated. A goodly number of members and new students were present, and all were invited to take part in the extemporaneous speaking. Mr. Kern read a humorous selection, which was much enjoyed. The *Gleaner* will be presented next week by J. T. Willard and Miss May McConnell. There will also be a debate. Question, "Resolved, That the President of the U. S. should hold but one term of office, and that it should be increased to six years." Affirmative, F. M. Jeffery and John Copley; negative, B. L. Short and W. J. Jeffery. R. L. Short

The Agricultural College, the first term of which, for the year 1880-1, begins to-day, is in a more prosperous condition than at any former period of its history. The number of students has been steadily increasing for the last two years; and this term, it is said, more will be in attendance than during the opening term of any former year. Emphatically, this is the school in which the sons and daughters of the farmer, mechanic and business man, can best be prepared for the active duties of life, and at the least expense. The course of study is quite as broad and varied as most students can master in the time allotted; and, as there is nothing superfluous,—nothing which will not contribute to a sound development of mind,—every student should be ambitious to complete it. Let the work be thoroughly done, and the ranks of the callings mentioned will be recruited by young men and women of whom any commonwealth might justly be proud. It is the paramount duty of legislators to see that this College lacks nothing to make it equal to the wants of the people; and the people should see that the duty is well performed. It is no disparagement to other State institutions to say that the Agricultural College, if in future, as now, judiciously managed, can do more than all the rest to promote the interests of the toiling classes of the people. For their sons and daughters it was planned,—a fact which they begin to appreciate; and it only remains for them to give it the preference due, to insure for those sons and daughters a training which will fit them for any scene or station in life.

As population increases, new buildings, larger and more complete laboratories, museums and libraries, will be demanded for the accommodation of the students which will assemble; and, in time, all these things will come, provided the people do not become unmindful of what they owe themselves and their successors.—*Clay Center Localist*.

THE NEXT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.
Second Year.—Algebra completed. Elementary Chemistry. Horticulture.
Third Year.—Geometry. Elementary Chemistry. Botany.
Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.
Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.
Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.
Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.
Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.
Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses. Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices. Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education. All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 11, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE,

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture.

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The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles west. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

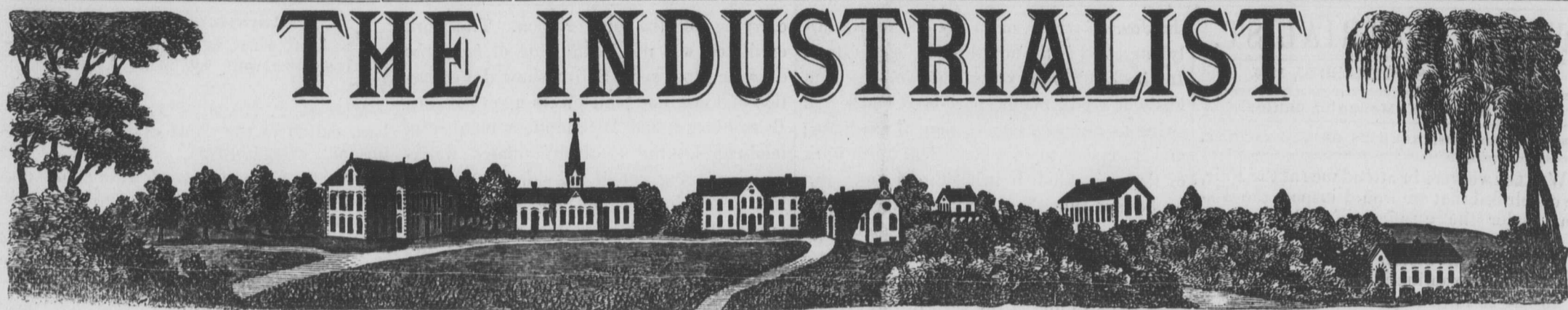
Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

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Historical Society



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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

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Manhattan, Kansas.

Origin of the Postage Stamp.

Quite an interesting and curious story is connected with the origin of the postage stamp. One day a girl came forth from an inn located in the northern part of England, and received from a postman a letter, which she turned over in her hand as she inquired the price of the postage. The man asked a shilling, a sum too large for one so poor as herself to pay, and so she returned the letter to the postman with sadness, although she knew that her brother had sent it. But a sympathetic traveler named Rowland Hill stood near, and at this moment interposed and insisted on paying the shilling himself, although the girl seemed strongly averse to his doing so. When the postman had departed, the kind-hearted Mr. Hill was surprised to find that there was no need for his pity; for the envelope, the young girl explained to him, contained no written communication, but on its outside were certain marks, agreed upon by herself and brother, from which, as she held the letter in her hands, she gathered all the information she desired. "We are so poor," she continued, "that we invented this mode of correspondence without paying for our letters."

Such duplicity set Mr. Hill thinking that a postal system which incited people to commit petty fraud must be very defective. He argued that if the price of postage was lowered from an exorbitant rate to one that came easily within the means of the mass of the people, so many more letters would pass through the mails that the financial condition of the treasury would not be impaired, while society would derive much additional benefit. He became so interested in the matter that he managed to bring his views to the notice of the British government, which gave him a favorable reception; and on January 10th, 1840, which may be considered the birthday of the postage stamp, letters began to be circulated in every part of the United Kingdom at the postage rate of only a penny. Rowland Hill became secretary to the postmaster-general; and during the next ten years, so great a change had taken place that in 1850 the number of letters sent through the mails was 7,239,962 against 1,500,000 in 1840.—*Exchange*.

The Unhappiest Man in Europe.

The most unhappy man in Europe is probably Ismail Pasha, ex-Khedive of Egypt, who has attempted to cultivate, in the uncongenial soil of Italy, the purely oriental exotic of a harem. When Ismail proved a misfit, and was served with a notice to quit his misgoverned country, he selected Naples as the next nearest to the ideal of a Turk's paradise, and moved over his plate, wardrobe, spare cash, wives, wines, eunuchs, and other theatrical properties, into a place that stands on a point jutting out into the bay at the foot of Vesuvius. Here misfortune began to attack him. First, a young Circassian, who was in training for the honor of forty-ninth wife to his highness, eloped with a young lawyer, and the courts decided that the ex-Khedive was living in Italian freedom—not in Egyptian darkness. Then a jeweler brought suit for an unpaid bill for a service of plate, and got a judgment, which the ex-Khedive had to pay. Then some of his swarthy janizaries got into conflict with the police, and were run in.

Persecutions followed thick and fast. When the houris went out sailing on the bay, infidel dogs lay to beside the barks and flirted with them; and when the thick-lipped slaves appeared in public, they were chaffed and hooted: and what with the Italians not appreciating his men and appreciating his women too much, poor Ismail sent word to his liege, the sultan, that he would sail for Constantinople. To this the sultan replied that if he attempted to land on Tur-

kish soil, he would be welcomed with bloody hands to a hospitable grave. And now the lord of many wives has loaded his peculiar cargo on his yacht, and is coasting around Italy with his family, limp and bedraggled and very much seasick, and looking for a place to turn in. It has been suggested that about the only place in the world that is prepared for the vagabond polygamist is Salt Lake City. The delegate from Utah should look into this, and relieve a brother who is suffering prosecution for a tenet of Mormon faith.—*Globe-Democrat*.

Culture of the Soil in Public-School Yards.

The enormous growth of our population, and the little unoccupied area left for further free expansion, should suggest the serious thought, whether we ought to require—as other nations are doing by legislative enactment—that every teacher should pass an examination in the principles of soil and plant culture, and that practical lessons in these principles should be given in every primary school. It is a consideration that concerns everybody; and one that eminently deserves forethought and timely action, because years must pass before it can be carried into full effect. During these years, all our really good soil will be occupied, and millions of our acres reduced by thoughtless or ignorant management to a lower and lower state of production; while our forests, which require a century for recovery, will have been wholly despoiled.

Lately a yard was seen, not very large, where about 400 children daily play,—in a railroad town with its full proportion of "street Arabs,"—yet there have been for years growing in it a great variety of plants, vines, and trees, with a handsome flower-bed gracing the front, all as safe as in any private grounds; the leaves unbruised and dense enough,—in the case of one vine supported only by a stake, giving shelter to a bird's nest within the reach of all hands above ten or twelve, yet so secure that the young were safely hatched. No rules exist for the preservation of these plants, but there is an offer of a reward of \$50, posted up, for the conviction of the spoiler of a tree, outside on the streetway. No teacher betrays personal anxiety; but a feeling of pride and possession is gently instilled, and every plant in the yard becomes dear to each pupil. They are often subjects of pleasing and instructive talk and object lessons.

For lessons in soils, etc., it is a first requisite that our normal schools prepare teachers on the subject. There is as yet no good text-book upon it in our educational lists.—*New York Tribune*.

STATE SUP'T LEMMON, in his admirable lecture entitled "A Plea for the Children," gives the following excellent advice to our warm-hearted mothers, uncles, and aunts: "Most children are directly encouraged by the presents they receive to give most of their time to play. 'As the twig is bent, so the tree will grow.' If you rear your children in idleness, they acquire false ideas of life, and walk in the paths you have pointed out. The names of idlers do not shine on the pages of history. Therefore, let your presents to the children be useful as well as amusing. Give them amusements, but have them perform due tasks in season. Teach them that 'life is real, life is earnest.' Grown-up country boys, inured to toil in youth, occupy most of the positions of honor and trust to-day. The hero is the man who has done something."

THE "corn belt" in Illinois has suffered from dry weather recently, and the corn crop will be considerably shortened thereby.—*Prairie Farmer*.

Our Exchanges.

The increase of the wool crop during the last year, in Kansas, was 42 per cent higher than that of any other State or territory. Nebraska and Texas come next with 15 per cent each.—*Emporia Ledger*.

Early last Friday morning two buffaloes were seen by some citizens, making their way west, about a mile south of town, across J. C. Arbuckle's millet. The buffaloes were soon headed off and turned east, when a chase ensued.—*Atwood Pioneer*.

Mr. Frank King, an Ottawa Indian who resides fifteen miles south of Baxter, exhibited a model of a steam plow he has invented and patented, at the court-house last Monday night. He is said to be the first Indian who has ever received a patent on an invention. The machine is said to possess superior merits over all inventions of that character.—*Columbus Times*.

Felix Baird, a harness-maker tired of life, took a dose of morphine last Monday morning, and died in the shop of P. J. Heilman, from the effects of it, during the afternoon. He had declared his intention to kill himself, and the day before had destroyed some of his papers and paid some small debts. He was described as a gentleman in manners and appearance, and a good workman, but addicted to the use of opium.—*Emporia Journal*.

Gold has been discovered within a few miles of Logan, in valuable quantities. Mr. Fred Albright, an old inhabitant of this township, brought in some fine specimens, that were tested and pronounced by old miners to be a very fine grade of nearly pure gold. One nugget weighed upwards of half an ounce. Mr. Albright is supposed to be the discoverer, but wisely keeps the whereabouts of the discovery a secret, but promises at no distant day to make the necessary arrangements for operating the mine.—*Logan Enterprise*.

As we take out our knife to remove a quarter-section of a turnip, fully thirty inches in circumference, grown from the seed in twenty-eight days, and turn our eye upon a thirty-one and a half pound watermelon, sweet and juicy as if raised in the Carolinas, we are the more impressed with the fallacy, want of foundation and criticism of the producing qualities of this country by those who have left and others who remain to abuse it, not having yet struck the keynote of success in agricultural and horticultural productions.—*Ellis Weekly Headlight*.

The sugar factory is now practically completed and in full operation. With the exception of a slight change in the arrangement of the pipes of the evaporator, everything is found to work most satisfactorily. The boiler, to start upon, is so set and arranged that it utilizes almost every particle of heat from the furnace. With the trashiest of fuel, the smoke is very slight in volume, and almost as destitute of color as the steam, although the draft is very strong. The engine and mill work admirably, and have shown a capacity of fully three tons of cane, or over 300 gallons of juice per hour.—*Anthony Journal*.

BELL, the inventor of the telephone, is described by "Gath" as thirty-two years old. It is added that Mr. Bell "received a large round sum for his invention, besides shares in the company as consolidated, and he has a salary of \$25,000 a year as an electrician. His father-in-law, Mr. Hubbard, of Boston, sold his property and embarked money in the telephone, and deserves chief credit as the business spirit of the invention. He has a million or two out of it, and is now in London, where a number of prominent English associates will join in companies for Egypt, India, China and Japan."

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 25, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

WHILST we were in attendance at the Fair, we concluded that we would inspect the display under the auspices of Riley county. We did so because that county is the one adjoining Pottawatomie on the west. In making our examination, we were surprised to see so large a quantity of that which we had seen before at the Agricultural College.—*Wamego Agriculturist*.

The writer of the above item never once saw, in the Riley county exhibit, a single article of any kind soever that he ever saw upon the farm or in any building of the Agricultural College. To speak with exceeding charity, he is mistaken.

The College and the Riley County Exhibit.

Wyandotte county took the second prize of \$500, at Bismarck. With the private premiums awarded, she secures at Bismarck nearly \$1,000. She need not feel otherwise than proud of her exhibits; and this being the first time, she will be encouraged to go in and win the first premium next year. Every citizen in the county should appreciate one fact, however. Had Sup't Dickinson and his associates had the State Agricultural College and farm to cull specimens from, as did Riley county, Wyandotte county would have secured the first premium. A protest was filed against admitting her exhibits on this one issue; but the judge did not honor the objections. The agricultural farm forms no part of the county; for, being a State institution, it is exempt from county taxes and laws, and is separate and distinct from county control as much as the government buildings and grounds of Fort Leavenworth are separate and distinct from the State of Kansas. The fruits on exhibition selected from the State farm; the specimens of wood taken from her groves devoted to forest-tree culture; the stock exhibited from her herds devoted to a higher development of the species; the specimens devoted to natural history, which were exhibited, are anything but the natural products of Riley county.—*Kansas City Journal*.

We are in hearty accord with the *Journal* as to the duty of the College in exhibiting its property at fairs; and our uniform practice has been consonant with the views expressed in the above article.

We exhibited our herds at Topeka in 1873, at Leavenworth in 1874, and at the local fair at Manhattan since; but not a single article belonging to the College has competed for any premium. Now a word about the Bismarck Grove exhibition. At this fair, the College exhibited, at great expense, a herd of cattle and one of swine, and, in the south corridor of the main exhibition building, a collection of grasses, corn, woods, agricultural minerals, and specimens of the work done in the several departments of the College; but all of these were separate from and in no wise connected with the Riley county exhibit. They were never shown with the Riley county products, but all were placarded with letters six inches high, "Exhibited by the Kansas State Agricultural College."

But it is intimated that the "State Agricultural College and farm" furnished most of the "specimens" exhibited by the county in which the College is located. This is a stupendous compliment for the College farm of 165 acres, and one that by no means offends us; but a love of truth and fair play compels us to deny the soft impeachment. The facts are these: Something like a month before the fair, the committee having the Riley county display in charge, in driving through the College farm, asked for a half-dozen stalks of pearl millet and the same number of specimens of rice corn and mangle-wurzels. These were cheerfully given; and we would have done the same thing to

the *Journal* writer, or to any one particularly interested in the new things of agriculture. In the last seven years, the College farm has sent seeds, plants, pure-bred cattle and swine to almost every section of the State; and it expects to do a good deal more work of the same kind, if it has the means. But we believe that these three specimens even, were not exhibited by the Riley county people. At all events, we looked for them carefully at Bismarck, but without success.

In the clipping at the head of this article, it is said: "The fruits on exhibition selected from the State farm [not one article of fruit grown on the College farm was shown at Bismarck]; the specimens of wood taken from her groves devoted to forest-tree culture [the wood specimens exhibited by Riley county were not to the extent of a grain of sawdust obtained, to our knowledge, from the College farm]; the stock exhibited from her herds [not a hoof, hide or hair, sir]; the specimens devoted to natural history,"—were not in a single instance, we sorrowfully confess, owned then or ever by the College.

We quite agree with the *Journal* that the College had no rightful place in a county competitive display; but we go further, and say that the College has no business anywhere in competition with private individuals at the fairs.—*Prof. Shelton*.

Fine Art at Bismarck Grove.

The State Fair at Bismarck Grove, just closed, was a grand success in every direction. The days were sunny and warm, the attendance unexpectedly large, the exhibits richer than the most sanguine had expected, and the whole programme passed off without the slightest jar. The grounds are undoubtedly the finest in the West,—beautiful by nature; and the buildings, erected for permanent use, are all on a scale of substantial comfort not often witnessed. Bismarck is centrally located, easy of access by rail and wagon; and now, as the great work of preparation is done, the fair will doubtless repeat itself often, and become a permanent Kansas institution.

We must leave it to papers of greater capacity to report the fair, which we enjoyed so much. Just one point: the art gallery was a total failure, and a strong contrast to the exhibitions of the products of agriculture and the mechanic arts. We confess that we have never seen a larger collection of poorer oil daubs, pencil drawings and pen flourishes, than those exhibited at Bismarck Grove. That beginners produce many horrid landscapes and portrait studies before their imagination will naturally flow from the brush, we know; but we never dreamed anybody could enter with such experiments a contest open to the world. It is surely a sign of utter lack of taste and art feelings. The photographs exhibited were much better; and a few specimens of pen lettering were real good. It is very significant, however, that the whole exhibit did not contain a single specimen of industrial, architectural, or topographical drawing.

The educational department in the main building was equally poor on exhibits in this direction. There was only one competitor for the two prizes (\$60 and \$40) for best school-house plans, and that was an architect from Iowa. His work was complete, but only fair in execution in its technical details. All attempts at ornamentation and coloring were quite poor. A cartoon by Architect Carr, of Leavenworth, however, was neat and tasty. We regret that he did not exhibit more. The contest in drawing from schools was between Salina and Wyandotte; the latter, we believe,

carrying off the blue ribbon. The work exhibited was not in the line of industrial drawing, however. Salina showed a collection of flower and fruit pieces upon polished Bristol board, and Wyandotte a number of landscapes,—the usual dilapidated water-wheel sticking out of the side of a log-butt into a foaming cascade, etc.,—upon hand paper. There was some talent displayed in both lots; but the work undertaken was rather beyond the comprehension of the pupils. Prof. Hay exhibited a well-drawn geological map; and one or two other teachers had brought in some outline maps of the State. These, with a map of the State Agricultural College Farm, drawn by one of our students, Mr. M. A. Reeve, were all we could discover in the line of fine art. It was a meager showing, especially when compared with other departments of the fair.

Was this exhibit a just one? Can we not do a little better next time?—*Prof. Walters*.

Orchard-grass vs. Kentucky Blue-grass.

In an article on the "Tame Grasses in Kansas," published in the *INDUSTRIALIST*, Vol. V., No. 49, the writer said of the two grasses named at the head of this article: "I feel confident that it (orchard-grass) will yield fully twice the feed that can be obtained from the same area of blue-grass or timothy; and in nutritive qualities it is certainly greatly superior to blue-grass." In the same article, we said particularly of blue-grass: "Our experience with this grass—a very extended one, by the way—has convinced us that for all useful purposes except lawns, in central and western Kansas, this is one of the most worthless of the tame grasses." These statements we know, at the time they were first published, provoked a good deal of discussion and some adverse criticism; but from subsequent experience on the College farm, we see no reason to modify these statements, unless it be to give them greater emphasis.

We have just returned from an examination of a field seeded partly to orchard-grass and partly to Kentucky blue-grass; and, understanding that the past season has been a very trying one in this section, to tame as well as native grasses, we were not surprised at the result. We found the blue-grass everywhere seriously injured, and often, in large patches, brown and sear, apparently quite dead. The orchard-grass, on the other hand, is a dense mass of broad, green blades nearly "knee high,"—a perfect jungle of feed which delights the heart of every passing stockman.

It is an interesting fact, however, that the field referred to is underlaid by a sandy subsoil; and we have noticed that where the soil overlays a clay subsoil, the blue-grass has received much less injury. But with orchard-grass, the character of the subsoil seems to have little effect, provided the soil is good.

We know as well as any one how valuable blue-grass is in those sections of the country where mild, wet winters prevail, but such seasons in this section of Kansas are rare indeed; and until that "change of climate" which some of our theorists say is imminent, is brought about, we have small hopes of growing blue-grass successfully and profitably hereabouts. But this gives us no alarm, as we feel confident that orchard-grass will be to Kansas what blue-grass is to Kentucky and Missouri.—*Prof. Shelton*.

THE *Troy Chief* took the prize at Bismarck for the best and best printed weekly newspaper. There was no other entry, 'tis true; but then the *Chief* would have got away with the baggage if there had been.

Educational Gossip.

The first prize at Bismarck for piano-playing, was won by Miss Arbuckle, of Ellis.

Miss M. P. Brace, of Leavenworth, has been called to the chair of English literature at Vassar College.

Bethany College opened with about one hundred scholars. The new building will be finished next January.

Kansas has more newspapers than any of the Southern States; and Illinois, more than all of the Southern States together.

Wirt Walton, of Clay Center, has presented the State Historical Society with a large lithograph of Hon. James G. Blaine.

Miss Mattie Spencer, a promising young elocutionist of Junction City, will shortly go to Philadelphia to attend the school of oratory.

The mason work on the new University at Holton is finished; and the carpenters are progressing finely with their part of the structure.

The invested permanent school fund, on deposit with the State Treasurer, amounts to about \$2,000,000,—more than that of the whole South.

A young woman applied for a school near her home in Pawnee county, Nebraska. A man offered to teach for less than she asked, and he has the school. The young lady now has charge of a herd of cattle, at eighteen dollars a month.

Prof. D. C. Tillotson, of North Topeka, has presented the State Historical Society with a number of broken specimens of old pottery found on the farms of Mr. McQuerry, Mitchell county, and Geo. Dickson, Osborne county. The specimens point to pre-Indian workers.

The lady teachers of Cherokee county are discouraged. A large per cent of the school districts of the county have voted to employ male teachers, which leaves many of the girls out; and they say there is nothing left for them to do but to husk and cut corn this fall and winter.

Among the school seats on exhibition at Bismarck, nothing can be compared with the automatic or self-folding, represented by Capt. Dobbs, of Lawrence. The committee on awards unhesitatingly voted the blue ribbon to the automatic, on account of its strength, noiselessness, economy of space, and healthfulness of position.

The editor of the *Hays Sentinel*, "having been laid across the knee of Miss Sarah Ann Brown, Democratic nominee for State Superintendent, for frequent omissions in the department curriculum of school-days," he is "prepared to certify to her competency. She has an eagle eye, rare concentration, and a magnificent muscle, not to mention talent."

The school board of Washington has rented Williams Hall for a school-room, the school building being too small to accommodate the scholars of the district. The hall will be occupied by the high-school department, and will be presided over by Prof. J. W. Haines, principal of the city schools. Washington ought to build a good, solid school-house.

One of the most noticeable displays in the art hall at Bismarck Grove, was made by M. H. Barringer, of the Lawrence Business College. The display consisted of pen and pencil work. Four of the pieces took premiums. A floral bouquet drawn by Mr. Barringer with a common steel pen, deserves especial notice. As an indication of its merit when on exhibition at the Illinois State Fair last year, it took the silver medal, and was awarded the first premium here.

The nominee of the Republican party for the office of State Superintendent of Public Instruction, is a very worthy young educator, Henry C. Speer, of Junction City. The son of a teacher, he has steadily followed educational pursuits. He was elected, when a mere boy, county superintendent of public instruction for Douglas county, and performed the duties of the office with zeal and fidelity. Removing to Junction City, he took charge of the school system of that city, and may be said to have re-created it. He has always been active in the meetings of the State Teachers' Association, and is personally known to all the prominent educators of the State. Mr. Speer is a man of energy and ambition. His life, so far, has been an education for the responsible position he will soon be called to fill.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 25, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Those who frequent the societies and prayer-meeting, find the new room a great improvement upon the old quarters.

Prof. Walters goes to Fort Riley to-day, to look after the proper execution of some ornamental designs in stage scenery, suggested by the Professor.

The Farm Department is sowing this year over twenty varieties of winter wheat. These, growing in plats side by side, will make a very interesting sight.

The Board of Regents meet in quarterly session, for auditing accounts, on Tuesday, Oct. 12th. All bills should be presented to the Secretary by October 5th.

Dr. Rock, editorial correspondent of the *Leavenworth Times*, made us a brief visit on Saturday last. We hope the Doctor will call again, and see the machine in motion.

Students continue to arrive; and the number now present is very close to two hundred. We shall enroll a good number over three hundred before the year has ended.

One of the largest calves that we remember to have seen, came dead on Thursday, the offspring of a two-year-old Short-horn heifer. This calf weighed 93½ pounds at birth.

The mower is running on the lawns to-day, and on that part of the ground known as "Field A," where a handsome crop of orchard-grass hay much more than pays for the labor.

By generosity of the Faculty and students, nearly a hundred copies of "Sacred Songs for Social Worship," have been procured for use in chapel, with manifest improvement in the music.

Not bad, this! One of the questions at an examination not a thousand miles from the geographical center of these United States, read, "Decline lady in singular and plural." The candidate made a clean score with the prompt answer, "Miss and Mrs."

A New York gentleman, whose name has escaped us, while looking over things on the Hill on Tuesday, remarked that he had been visiting Bismarck Fair, where he had heard and seen so much of Riley county that he determined to come and see the country where the things grew.

We get a good many postals containing the somewhat startling request that the INDUSTRIALIST be sent to the writer for a greater or less time. All such persons are referred to a short but pointed article in the left-hand corner of the first page, which says in effect that the INDUSTRIALIST may be had a whole year for fifty cents.

The College has received, from the Bureau of Education Circulars of Information Nos. 2 and 3, 1880, and other pamphlets; from the Chief of Engineers, U. S. A., "Decrease of water in springs, creeks, and rivers," by Sir Gustav Wex; catalogues from Ohio Wesleyan University, Tufts College, Mass., Washington and Jefferson College, Penn., Swartman College, Penn., and Fisk University, Tenn.

The regular fortnightly public exercises of the year were opened by President Fairchild, in a very instructive and suggestive lecture having for its subject, "The Discipline of College Drill." No one, we believe, is better qualified to talk on this subject than President Fairchild; and the close attention given by the students to every word uttered by the speaker, compels the belief that this lecture will do much good.

About 120 students went down to Lawrence on Friday of last week, to feast their eyes on the sights at Bismarck Fair. We have examined the Lawrence papers of that date carefully, and find that the number of "arrests" on that day were no greater than common; and as the references to the "rural couple," who always wander hand in hand while munching peanuts and crackers and looking unutterable things, are not numerous, we conclude that our young people behaved themselves while in the historical city.

The following is the arrangement of classes for the present term:—

First hour, 8:40 to 9:30.—Agriculture, Hygiene, Botany, Arithmetic A, English A, Drawing B, and Industrials.

Second hour, 9:30 to 10:20.—Geometry, Chemistry, English B, and Industrials.

Third hour, 10:20 to 11:10.—Psychology, Algebra, Drawing A, and Industrials.

Fourth hour, 11:10 to 12:00.—Chemistry, Horticulture, English A, Arithmetic A, and Industrials.

Fifth hour, 12:00 to 12:50.—Meteorology, Arithmetic B, and Industrials.

The Webster Society was called to order last Saturday evening by President Reeve. The opening exercises were followed by the installation of the new board of officers. President Reeve retired from the chair with a spirited address, in which he stated the object of society work, and the inducements which such training offers to new students. The inaugural remarks of President Knaus were brief, but right to the point. The debate was then opened upon the question, "Resolved, That the office of county superintendent is an unnecessary expense." The speakers upon the affirmative were Messrs. Hollenberg and Allen; upon the negative, Messrs. Paine and Mason. The affirmative were in favor of abolishing the office of county superintendent and distributing the labor among the county and district officers; while the negative argued that to the labor of county superintendents we owe, in a great measure, the improvement of our common schools during the last decade. The decision was in favor of the negative. In the order of extemporaneous speaking, most of the company took part, the topic nearest the hearts of many seeming to be the excursion to Bismarck. An interesting programme has been prepared for the next meeting, including the *Reporter*. A lively time may be expected. Don't fail to come out. S. C. MASON.

Last Friday afternoon, immediately after the President's lecture, Society Room was well filled by the Alpha Betas and their visitors. After the usual opening exercises, the officers-elect were examined and installed. The *Gleaner* was presented by Mr. Willard and Miss McConnell, and showed that both members and editors had been faithful, the result being a very interesting paper.

Misses Amy Noyes, Hattie Blades and Phoebe Haines, and Mr. Henry Cottrell, were initiated. A large number of names were proposed for membership. Debate on question relating to the time that children should be compelled to attend school, was interesting and profitable. On account of the lateness of the hour and pressure of other business, extemporaneous speaking was passed. Twice during the session the Society was favored with violin solo and accompaniment; solo by Miss Fairchild. The editors of the *Gleaner* to be presented in two weeks, are W. J. Jeffery and Miss Cranford. Debate upon the question, "Resolved, That the execution of Major Andre was not justifiable," will be discussed next week by E. H. Kern and Grace Parker on the affirmative, and E. Allis and May McConnell upon the negative.

New students will find it both profitable and enjoyable to visit the literary societies of the College, and decide ere long to join one or the other of them. Visitors will be welcomed by the Alpha Betas every Friday afternoon. A. B. QUILL.

AS OTHERS SEE US.

The State Agricultural College made a splendid showing, one of which it, Riley county and the State are proud; but it added nothing to the Riley county exhibit.—*Kansas Tribune editorial on Bismarck Fair.*

Among the many exhibitions at Bismarck Grove, that of the Agricultural College of Manhattan should not be overlooked. It is one that reflects great credit upon that institution.—*Lawrence Journal.*

There seems to be a great rush of students at the State Agricultural College, at Manhattan. This is indeed a hopeful indication. What is especially needed in Kansas, is a diminution in the number of indifferent professional men, and a more general adaptation to the culture of corn and potatoes.—*Elk Falls Signal.*

The report of the Agricultural College is full of practical interest. The institution is evidently organized upon the best model for giving to the industrial classes precisely the knowledge demanded in the daily work of life. The comprehensive experiments with various crops, in stock-raising and tree-planting, are instructive and practically useful. Time has permitted only a partial examination of this document as yet; but I have seen enough to make it evident that this new State is fully abreast of the most favored in all that belongs to a comprehensive, liberal, and efficient system of education.—*Topeka correspondent in Inter-Ocean.*

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for

absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

Nos. 1 and 2 run daily. No. 3 runs daily except Monday. No. 4 runs daily except Sunday.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. WM. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WARREN KNAUS, President.

GEO. F. THOMPSON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

G. H. FAILYER, President.

D. S. LEACH, Secretary.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange is sued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

THE INDUSTRIALIST.

SATURDAY, SEPTEMBER 25, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope. The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefices and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with a such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE,

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings, Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.



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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains are taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Hog-Killing in Chicago.

The Union Stock Yards Company is a gigantic corporation with a capital of five millions of dollars. It has an area of ground of about three hundred and sixty acres; and on a fair day one may overlook in its yards and pens about three hundred and twenty-five acres of cattle and hogs. This area is penetrated by the tracks of sixteen railroads, with forty miles of rails. In this yard twelve hundred cars of stock can be unloaded and taken care of daily. The yards have fifteen miles of macadamized streets, and forty miles of water and drainage pipes. In this inclosure is a mammoth hotel of the first class, a vast exchange building, containing all the offices of the company and over a hundred rooms for commission firms, a board of trade, telegraph office, reading-room, saloon, newstand, barber's shop, and various other conveniences; with a restaurant sixty feet by eighty, a handsome room made cheerful by a profusion of growing plants and flowers in bloom, and vocal with the singing of scores of birds of many species, in cages large and small. The establishment has its own bank, in which the transactions are enormous, and its daily newspaper devoted to the arrival, death and value of animals, which has the stock news of all the world. All the talk in this little world is on one subject. Life seems to be a mere question of receiving and dispatching cattle and hogs: its heroes are those who have collected or killed the most hogs. A stranger who is guiltless of the blood of these animals, feels that he has led a trivial existence. But if it is a place of death and transit, it is a place of repose. Here, at the end of their long pilgrimage, may lie down at rest in one night, twenty thousand cattle, one hundred and fifty thousand hogs, five thousand sheep, and a thousand horses in stables.

To this great depot and mausoleum, are wending every day in the year vast herds from far Oregon, from lower California, from Texas, slowly feeding their way through many months, until they reach the railways: these vast and constant streams are reinforced by lesser rills of the live stock from all the western country, until the highways of the rail are gorged with the living freight, and the bellowing, squealing concourses, whose good health and fitness only insure them speedier death, are dumped into that plain of destruction to feed the insatiable maw of the public. It is a transaction of voracity fit to make an angel weep.

During the year 1879, there were received into these yards 1,215,732 cattle, 6,448,330 hogs, 325,119 sheep, and 10,473 horses. The human mind is happily so constituted that it cannot take in six millions of hogs at once. It refuses to believe the fact that a million of these disagreeable animals came together in convention here in one month,—the month of January.

What is the fate of these unfortunates? Sausages and hams, mostly. Some of them travel farther; but swift death is merciful to the majority. This is the place where twenty thousand hogs are done to death in ten hours.

In my recollection of New England, the killing of a hog was an event which occupied the attention of a neighborhood for a day. In one of the great packing establishments, one of the buildings of which covers four acres of ground, in the month of June, — which is not a good month for honors — I had a vision of sudden death. A man with a mild expression, a cool eye, a quick hand, and a sharp knife, was killing seven hogs a minute, stabbing in serenity each squealing dangler as it came within his reach, suspended by one leg, and gravitating down the fatal wire. And I watched the long line on that railway of death, transformed into something more lifeless and dis-

integrated at every station by a hundred deft hands, until in the far vista I saw suspended acres of pork, all the noise and protest taken out of it now, and beyond that acres of sausages, in coils like the beginning of a new life. Before the squeal has fairly gone out of the poor brute, he is as thoroughly distributed as the mail in a post-office.

One does not witness all this vast movement of the raw material without a new impression of the energy and rapacity of man. —Chas. Dudley Warner in "Good Company."

A Little Latin.

An effort is being made to induce doctors to stop writing their prescriptions in Latin and use United States language. So many inoffensive sick people have been killed by a druggist putting up lobelia and other dangerous drugs in place of some mild and gentle purgative, which the system requires at this time of year, on the Latin prescription of a physician, that a society at the East threatens to take the law in to their own hands and put a stop to it. As a usual thing, the physician who graduates with high honors at some high-toned morgue, does not know any more about the common English branches than is good for him, and his handwriting is the merest goose tracks, — a sort of delirium tremens on paper. Now, when you come to put such writing as that into Latin, to be read by a sleepy prescription clerk who has been routed out of bed at midnight in his shirt sleeves, there can only be one result. The patient will be worse next day. A sleepy drug clerk is only human; and when he strikes one of those ingredients in the prescription where it tells him to put up three saw-teeth of podophyllum, and the word looks more like pennyroyal than it does like podophyllum, and more like peppermint than either one of them, he is liable to trust a good deal to luck and put in that which is the least injurious. No drug clerk cares to lose a good position by not being able to read a stroke of lightning; and the result is he puts up something, and then charges enough more to make up for what he doesn't know. There are forty-eight millions of people in this country, whose lives, to a greater or less extent, rest on prescription clerks; and the eastern society who have flung their banner to the breeze and sounded the death of the dead languages, will be embalmed in the hearts of a grateful posterity. They are doing a noble work. Dead languages are well enough for dead people; but they are eminently out of place in this age of animated things. Of course the lopping off of the excrescence will bring doctors down to a level with ordinary mortals, and they will have to take their chances. —Peck's Sun.

They had All had It.

A health officer writes to a Canadian medical journal: "Inspected a house in the country at the request of the attending physician, as the general health of the family had been bad for a long time, they having suffered from a class of complaints that would indicate bad drainage, etc. Found under the floor a wooden drain with rotten cover, and a soil saturated with sewage; trap on water-closet non-effective; water-closet foul; situation very bad; ventilation so arranged as to poison the room above it, a sleeping apartment occupied by a young man suffering for a long time from general ill health. No trap on kitchen sink; water supply, cistern connected directly with the sewer without traps in the overflow pipe. On my reporting the latter fact to the family, and expressing my surprise that they had not all had typhoid fever, they exclaimed in chorus, 'Oh, we have all had it!'"

Our Exchanges.

Don't abuse your neighbor because he sees political matters in a different light than you do. It won't help the matter any, and you may get your eye blacked. Look at ours, for instance. —Galena Miner.

For the past two weeks, persons looking toward the sun could see the glittering grasshopper in the upper strata of air. At first he went southeast, then northwest, but more recently he has been going southeast again. So long as they stay in the upper strata, we can stand them. We only hope they won't light. —Norton Advance.

The North Topeka rolling-mill is now running along night and day regularly; and not an accident of any kind has occurred for over a month. Two hundred and twenty-five men are furnished constant employment. The two new furnaces, which were mentioned some time ago as being constructed in the south part of the building, will be ready for use next week; and the mill will then be able to turn out a mile of rails per day, or about 85 tons. —Capital.

The Wichita Beacon says that a small force of men, under the direction of Capt. Curtis, U. S. A., are at work constructing wing-dams in the Arkansas river, above the bridge. Eight of the dams have been made (of willows) at a cost of \$50. The river is quite high; and the water must fall before the result can be noted. \$35,000 have been appropriated for the purpose. If the river is not made navigable, it will at least furnish employment to a large number of laborers.

Day before yesterday, the family of James Scott, consisting of a wife and five children, were thrown into convulsions by partaking of sardines that had been purchased only a few minutes previously. Drs. Hutchins and Davis attended them, and they are all comfortable now. The sardines were noticed to have a peculiar odor, and the side of the box which was opened was badly corroded. Dr. Hutchins informs us that the family exhibited every symptom of arsenic poison. —Galena Miner.

The culture of broom-corn is likely to receive more attention at the hands of our farmers hereafter. In a recent conversation with D. R. Stoughton, of Roscoe township, we learned that he has eighty acres in broom-corn. He has gathered it, and will sell the crop for about \$1,000. He says that he thinks next year there will be about 500 acres in his neighborhood devoted to this crop. Joseph Grayson, who has a farm in Lincoln township, had some seventy-five or eighty acres this year, which he says will pay him well. He expects to have about fifteen tons. This at \$90 per ton is a paying crop. —Hutchinson Interior.

The Upper Story.

It does not seem to have occurred to some ultra-scientific theorists on education, that the mind of man has "many mansions," — upper chambers open to the world of souls, no less than a basement story touching the common earth. A clean cellar, perfectly drained, good for the storage of all useful things, is always in order. But there is such a thing as living so exclusively in the basement, so absorbed in its ventilation and orderly arrangements, that the whole suite of rooms in the upper story of the soul is left as the habitation of rats and wasps, — a labyrinth of household lumber, full of bad smells, damp ceilings, and general abomination. Malaria descends as well as ascends; and many a wise man is all right in the lower story, and expert in the little practical conveniences of his mortality, who is as dry as dust — a very magazine of destructive malaria — in the whole upper region, which alone declares him a man, created in the image of God. —Exchange.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 2, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THERE is a college west of the Mississippi which claims that its courses of study "are adapted to the needs of those intending to teach, and prepares them for the actual duties of life in any pursuit." There is "no vacation between terms: students can enter at any time and choose their own studies." "Graduates are successful in whatever they undertake." Surely a "royal road to learning" has been discovered, and a highway to success opened up!!

SUP'T WICKERSHAM, of Pennsylvania, in a recent discussion on technical training in public schools, said: "The time has come when we should supplement our teaching with something more of general industrial education. Mechanical knowledge is very important; and we should like to see the experiment tried of taking classes and devoting one-half of the time to study and one-half of the time to mechanical training, cultivating the hand and eye." If Dr. Wickersham will visit the Kansas Agricultural College, he will see what he desires, not as a matter of experiment, but an accepted part in an established course of study.

AN interesting controversy concerning our title to Oregon, has been carried on some time in the educational journals, by some eminent historians. Prof. Anderson, the compiler of several histories, asserts that our title to Oregon in no sense depended upon the Louisiana purchase; while others, especially Prof. Ridpath, also a compiler of a U. S. History, affirms that it does. Prof. Ridpath, in a recent number of the *Journal of Education*, plainly shows that Prof. Anderson is in error. If we were umpire, we should decide the contest closed, and should advise Prof. Anderson to revise his U. S. History.

Industrial Education.

It is worthy of notice that, in nearly all the great educational meetings held during the past summer, considerable pre-eminence was given to the subject of industrial education. It is only within a recent period that this expression has come into use in educational circles. It now ranks in the educational nomenclature with "classical education," "scientific education," and "professional education." The long-protracted discussion in regard to the relative importance of the classics and the sciences in the college curriculum, has closed. After the hard-fought battle, the combatants are found encamped on the same field. All difficulties have been adjusted. It is now generally admitted that there can be a higher education in the sciences as well as in the classics. After reaching a certain stage of advancement, students are permitted to select their studies; and the ancient classics, modern literature, or the sciences, are pursued, according to the taste of the individual student. In the public estimation, the degrees of B. S. and A. B. stand on an equal footing. He who is entitled to attach either to his name is supposed to have received the higher education. But these general courses of study are only preparatory to the special courses required for entering the professions; and the few who have taken them are distinguished from the many who have not, mainly by the reputation of being "highly educated." Admitting that a higher education is not restricted to any one line of study, the question at once arises, Is there not a higher

education for the industrial classes as well as for the professional classes?

The colleges founded upon the land grant of 1862, owe their existence to a belief in the affirmative of this question. Provision was made by Congress, under which a college for the higher education of the industrial class could have been established in every State of the Union. The fact that so few have been organized and maintained in accordance with the spirit of that act, attest to the general incredulity on this subject. But the work that has been accomplished during the last fifteen years by the few real industrial colleges in the land, is beginning to tell. Hence the discussion referred to in the beginning of the article.

The reports of these discussions show that the subject and scope of industrial education are not yet clearly defined. The views of prominent educators are widely different. Some would attach workshops to our literary colleges, and have a course in handicraft run parallel with a course in the classics; others would supplement the present school studies with a brief apprenticeship in the various arts and trades, at the public expense; others advocate the introduction of the trades into the public schools. An enthusiast of this last-named class, at the last meeting of the Teachers' Association of the State of New York, exhibited specimens of work in wood and in metals, made by the children of a rural school of which he was the principal.

The fact that this subject of industrial education has at last forced itself upon the attention of the teachers of the land, is encouraging. We may expect that technical schools and agricultural colleges will be fully recognized in the American educational system.—Prof. Ward.

Destroying Insects by Fungoid Diseases.

Much interest has recently been manifested in the study of fungi destructive to insect and plant life. A number of students have turned their attention to experiments, with the view to determine the efficacy of these destructive fungi as a means of destroying noxious species of insects. In a paper recently published in the *American Naturalist*, for a copy of which we are indebted to the author, Prof. A. N. Prentiss, is given an outline of the experimental study in this direction.

The idea occurred to European scientists as much as twelve years since; but the subject has received the attention demanded by it within a few years only, and in the United States. To Dr. John LeConte belongs the credit of having first proposed in this country the destruction of noxious insects by this means. At the Portland Meeting of the American Association, he recommended the "careful study of epidemic diseases of insects, especially those of a fungoid nature, and experiments on the most effective means of introducing and communicating such diseases at pleasure." This suggestion was induced by an example having come under his observation of the "destruction of the entire caterpillar population of a twelve-acre lot of forest land by the accidental introduction of pebrine, or muscadine, from a neighboring colony of silk-worms."

Prof. Peck, the State Botanist of New York, proposed a similar encouragement of fungi known to injuriously affect weeds of various kinds. Among other things, he says, "The troublesome bur-grass (*Cenchrus tribuloides*) is sometimes infested by a smut fungus which not only prevents the development of the seeds of the grass, but also the annoying bur-like involucre. It may yet be found practicable to keep down the grass

by the artificial dissemination of the spores of its parasitic fungus."

In his work on "Fungi, their Nature and Uses," M. C. Cooke states (p. 218 *et seq.*) that twenty-five species of one genus of fungi (*Torribia*) are parasitic on insects. He cites also species belonging to other genera as fatally infesting various insects in different stages of growth; among them the commonly observed house-fly fungus, which attacks these pests during the present season of the year, surrounding and filling their bodies with a white growth.

Examples of the white-grub fungus are familiar to most farmers. The grub affected is changed to a brittle, solid body with a long, curved, whitish fungus growing from the lower part of the head.

These several instances tend to show the destructive influence exerted on insect life by some of the lower plant forms. Abundant evidence also shows that the spores of these and other fungi are sometimes so numerous as to fairly fill the air of the locality.

Dr. Hagen, of Harvard College, has frequently urged the employment of common yeast as most available fungus for imparting the disease to troublesome insects. This fungus, prepared by diluting yeast or beer with water, was to be sprinkled over the insects, when it was hoped the fungus would attack the insects placed thus under its influence, and these would communicate the disease to others by contact.

The experiments of Dr. Prentiss, recorded in the pamphlet mentioned above, were conducted in the manner recommended by Dr. Hagen. The insects experimented with, were the aphid, scale insect, and red spider, living on greenhouse plants in pots, and consequently entirely under the control of the operator, in the experiment.

These insects were treated with the yeast fungus by sprinkling it over the plant, taking care to wet both the surface covered by the insects and the bodies of the insects as well. The continued healthy multiplication and growth of the insects so experimented upon, were, to say the least, not favorable to Dr. Hagen's conclusions. Experiments with the cotton-worm, conducted under the direction of the U. S. Entomological Commission, were also negative in their results. So that it must be concluded, either that the experimenters have not succeeded in producing the conditions required for the development of the fungus in a form fatal to insects, or that the yeast fungus is not reliable as a remedy. Another objection to the use of yeast under these circumstances is drawn from the possibility that it might and probably would induce fungoid growth that would injuriously affect the plants, instead of, or as well as, the insects which it proposed to destroy. One of the most troublesome things to contend with in the greenhouse is the liability of some plants to fungoid disease; and this liability would doubtless be increased by filling the air with the spores of the yeast plant, as would be the consequence of the continuation of the experiment.

It is highly probable, however, that a continuation of the recent active investigation in this direction will lead to the employment of other fungi, or their application by methods more successful to the end in view. We are able more or less surely to control fungoid disease in case of certain insects of economic value; and no reason should exist why we should not finally be able to encourage destructive fungi in other cases. A field of interesting and possibly of economically important experiment is here open to the botanist and entomologist.—Prof. Popenoe.

Chapin's First Principles.

We call attention to a work entitled, "First Principles of Political Economy," prepared by Pres. Chapin, of Beloit College, and published by Sheldon & Co., of New York City. The work gives within a small compass a concise, yet clear and simple, statement of all the most important principles of political economy. The subjects now agitating the public mind are distinctly treated, not in a partisan way, yet with a view to establish sound opinions. Thus, the relations of labor and capital, the distribution of profits, the functions of money and credit, and other practical topics of present interest, are discussed in a plain, common-sense way. Although prepared as a text-book for schools, it is a book that may be read with interest and profit, in the home and the office. The fundamental principles of political economy are as fully established as those of any other science, and they are within the comprehension of all. We should like to see political economy introduced into all our high schools, even to the displacement of some of the physical sciences, which can only be studied, with profit, in connection with illustrations and experiments, which require expensive apparatus. Teachers can procure a sample copy of this work, for examination with a view to introduction, by sending twenty-five cents to the publishers.—Prof. Ward.

Educational Gossip.

Manhattan has a kindergarten.

Over 300 names were enrolled at the State University, the first three weeks of the term.

The editorial chair of the State University *Review*, will be occupied by Prof. Caruth this winter.

Prof. Boissen has opened a class in stenography, at the State University. He is said to be an expert in that art.

The Kansas City *Times* urges Miss Sarah Brown, the Democratic nominee for the State Superintendent's office, to stump the State, promising to send an extra reporter with her. Wade in, Miss.

Washburn College opened its fall term with about seventy pupils. A few of them were from Iowa, Wisconsin, and Missouri. The capacity of the buildings will not permit the heavy increase in attendance which is expected.

Tally another for the girls. Theresa Tua, of Turin, a girl of thirteen, bore off the first prize as a violinist, at the Paris conservatory, last year. She has been offered \$40,000 for a five-years' tour through the United States.

The Jesuit fathers of St. Mary's Mission, Pottawatomie county, have let contracts for a large addition to their main college building. It is to be built of stone, five stories high, with a mansard roof. The attendance this term is very large.

Ex-Governor Chas. Robinson, of Lawrence, has presented the State Historical Society a large picture of himself, painted by Mr. Q. E. Ruggles, of Salina, and valued at \$500. The painting is an excellent likeness, is enclosed in an elegant frame, and will be hung with the many pictures of other men famous in Kansas history.

From the *Kansas Star*, the organ of the State Deaf and Dumb Asylum, at Olathe, it appears that that institution is steadily growing in public favor. Up to date 107 pupils have arrived, with few exceptions in good health, and ready for a year's work. Of these, 24 are new pupils; four have attended other institutions, and are able to go into advanced classes. There are yet to arrive a number of both old and new pupils, so that the attendance will probably reach 125, a reasonable increase over last year.

COWLEY county has this year such crops of all kinds as would be called a fair average in some States; but it is a fact that the wheat crop was much the poorest we ever had, and corn and other crops are unusually light. It is a fact that the year 1880 has been the driest year since the settlement of the county, not excepting 1874, the grass-hopper year.—Winfield Courier.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 2, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Next week we shall give a full list of the names and residences of all students so far enrolled.

A large number of old students visited the College during the fair. They are always welcome.

We call it a very fair beginning, with 204 students at the end of the third week of this year.

We are indebted to Regent Wood for samples of a number of kinds of winter wheat, mostly of his own raising.

Mr. Chas. A. Sweetland, special correspondent of the Chicago *Inter-Ocean*, looked through the different departments of the College, on Friday.

The Board of Regents meet in quarterly session, for auditing accounts, on Tuesday, Oct. 12th. All bills should be presented to the Secretary by October 5th.

Two of our former students, J. E. Shaffer, of Douglas county, and J. M. Graves, of Atchison county, attended the Christian State Missionary Society as delegates.

Hon. Jno. A. Anderson, M. C., our former President, will address the citizens of Manhattan and vicinity, upon the national issues of the day, Thursday evening, Oct. 7th.

Mrs. J. A. Anderson, in the absence of Congressman Jno. A., kindly remembers as with several samples of new kinds of wheat, furnished for distribution by the Department of Agriculture.

We are glad to welcome back to Manhattan George F. Thompson, one of our old students, who has accepted a "sit" in the *Nationalist* office, and is now doing credit to our Printing Department, in which he learned his trade.

How much the Agricultural College contributed to the Riley county exhibit at Bismarck, has been fully answered; but how much the Agricultural College has influenced the agriculture of Riley and adjoining counties, is not so easily determined.

And now we are happy to learn that another lady graduate of the College has taken her second degree. Miss Ella M. Vincent, B. S., is now Mrs. George McCormick. Congratulations and best wishes of "troops of friends" are given through the INDUSTRIALIST.

A vigorous "pole raising" and "wire pulling" has been carried on, during the week, by a force of students, under the supervision of Mr. Graham. We suppose these poles are erected in honor of some "lightning candidate," as they support a good deal of the slippery, forked stuff.

Although the chapel is too small for the number of students, the class-rooms not large enough, the sidewalks too narrow, and the classes unwieldy, we do not remember to have seen the different parts of the institution run with less friction than during the past three weeks.

The State Missionary Society of the Christian Church held its annual session in Manhattan during the present week. A large number of the delegates visited the College yesterday morning. Messrs. Johnston and Ellett, in behalf of the Society, congratulated the students on their privileges, and gave them some excellent advice.

The Loan Commissioner, M. L. Ward, solicits correspondence from school officers and county superintendents, in regard to school bonds. Blanks are furnished gratuitously; and, when dates are furnished, are filled out ready for signatures. Face value paid for bonds, and proceeds remitted without expense to the districts.

The Topeka *Daily Capital* will be enlarged on Oct. 4th. It will then be "as large as any daily journal in Kansas." The *Capital* is a very energetic, combative, and, we had nearly said, "sassy" fellow, who raps folks on the knuckles, "talks back," and is no respecter of persons. For the same reason that the blacksmith's arm is developed, we expect the *Capital* to grow, which calls for no regrets on the part of the INDUSTRIALIST.

Mr. Rollins' young Berkshire boar, which has taken many honors at Bismarck and elsewhere, finally winning at Kansas City the "sweepstakes" prize for the "best boar of any age or breed" on exhibition, was bred by the College. Another College graduate has distinguished himself: by which we mean that the magnificent bull, "Gompachi," purchased of the College by Messrs. Bill & Burnham, has won many honors, much admiration, and yards of blue ribbon, in his late circuit of the fairs.

During the month of September, the College purchased the following school bonds: Republic county—Dist. 33, \$400; Dist. 98, \$500; Dist. 77, \$320; Osborne—Dist. 50, \$100; Mitchell—Dist. 32, \$300; 107, \$125; 86, \$140; Sumner—Dist. 118, \$500; 142, \$125; 110, \$345; Jewell—Dist. 64, \$600; 123, \$175; 111, \$337; 66, \$125; Labette—Dist. 48, \$540; 29, \$1,500; Phillips—Dist. 8, \$320; Marshall—Dist. 89, \$600; 91, \$200; Osage—Dist. 43, \$700; Smith—Dist. 13, \$350; Franklin—Dist. 1, \$1,500; Morris—Dist. 48, \$100; Davis and Riley—Joint Dist. 13, \$500. Total, \$10,402.

Notwithstanding a stormy night, Society Hall, Saturday, Sept. 25th, was well filled. Debate was opened by Mr. Houston on the question, "Resolved, That printing has done more to advance civilization than has navigation," followed by Mr. Reeve on the negative. They were supported by Messrs. Myers and Leach. The question was ably handled on both sides, but was decided for the negative. The *Reporter*, under the editorial management of Mr. Knaus, came out with colors flying for Hancock and English. The Websters give all sides a hearing, and can cheerfully afford one paper in a term for Democracy. A declamation, "Marmion and Douglass," was rendered by Mr. Corey. The question adopted for next debate was "Resolved, That the invention of labor-saving machinery has been a detriment to the laboring classes." This is sure to call forth an animated and instructive debate. A cordial invitation to all.

SCRATCH-PAPER.

The Scientific Club held its first meeting for the year, last evening. The following officers were elected for the ensuing term: President, I. D. Graham; Vice-President, W. Knaus; Recording Secretary, G. H. Failyer; Corresponding Secretary, Dr. Blachly; Treasurer, Prof. E. A. Popenoe; Librarian, S. C. Mason; Executive Committee, G. H. Failyer, I. D. Graham, W. Knaus. A paper on the "Birds of Kansas" was read by Dr. Blachly. The Doctor has the finest collection of birds in the State. His paper was of unusual interest, as was evinced by the numerous questions asked and suggestions made. Then followed a rambling discussion on metaphysical topics. The next meeting of the Club will be on the first Friday evening of next month. At this time, papers will be presented by Profs. Walters and Graham, C. E. Wood and D. S. Leach.

SECRETARY.

Promptly at two o'clock Friday, the Alpha Beta Society was called to order by President Lightfoot. Roll-call showed that, although it was Fair day, many had foregone the Fair for the Society. After music, the following persons were elected and initiated: Messrs. Clark, Clothier, Barrett, Dunn, Hutto, McNair, Pense, and Swingley, and Misses Allis, Brown, and Peck. Extemporaneous speaking was participated in by many, and enjoyed by all. Declamation by Miss May Quinby was very fine indeed. Debate upon the question given last week was decided, by the judges, in the negative. Under the head of miscellaneous business, the committee on decoration reported progress, and were continued. The treasurer's report was given, filed, and accepted. A committee of three were appointed to divide the Society equally into two divisions for the purpose of writing for both divisions of the *Gleaner*. The duties appointed for two weeks are: declamation, Henry Cottrell; essay, Emma Campbell; select reading, Jacob Lund. Debate next week upon the question, "Resolved, That Calhoun was guilty of treason," will be discussed by F. W. Dunn and Charles Barrett upon the affirmative, and Mr. Swingley and John Copley on the negative. The Society was glad to greet as visitors four of our ex-Presidents, Messrs. Platt, Sikes, and Blain, and Miss Sickels. If all members should be as faithful as have these in time past, we should feel that success was insured. Come out next Friday and hear the *Gleaner*.

A. B. QUILL.

The catalogue of the State Agricultural College, at Manhattan, is upon our table. We have had many good words for this Institution in the past, and have no cause to retract them now. May the Agricultural College long prosper as an honor to the State.—*Wellington Press*.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses. Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for

absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. WM. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WARREN KNAUS, President.

GEO. F. THOMPSON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.

G. H. FAIYER, Secretary.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange are issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 2, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE.

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE.

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

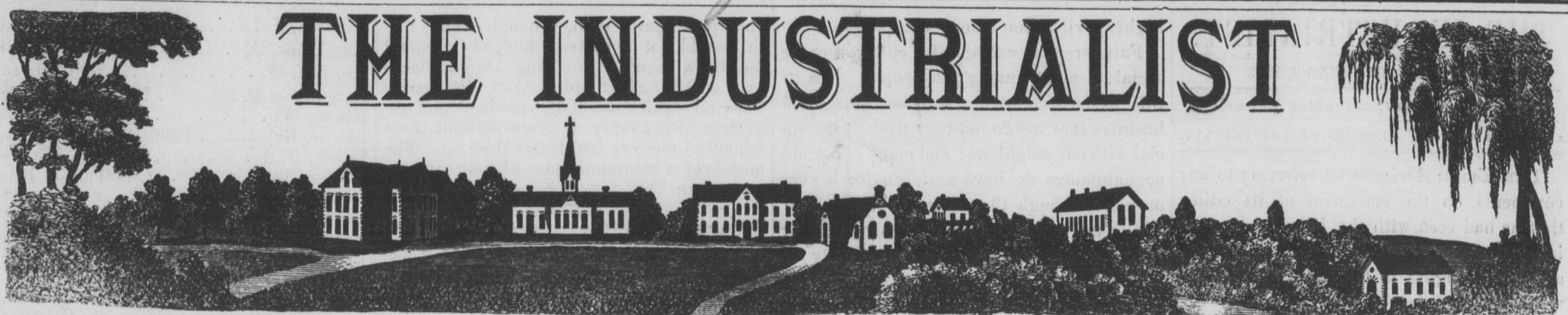
Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

Historical Society



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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."
Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

A Lightning Flash.

The destructive effects of lightning are familiar to all of you. All the more ordinary effects can easily be reproduced by the help of Leyden jars on a small scale. How small you may easily conceive when I tell you that a three-foot spark is considered a long one, even from our most powerful machines; while it is quite certain that lightning flashes often exceed a mile in length, and sometimes extend to four and five miles. One recorded observation, by a trustworthy observer, seems to imply a discharge over a total length of nearly ten miles. When a tree is struck by a violent discharge, it is usually split up laterally into mere fibers. A more moderate discharge may rupture the channels through which the sap flows; and thus the tree may be killed without suffering any apparent external damage. The results are usually assigned to the sudden vaporization of moisture; and the idea is probably accurate, for it is easy to burst a very strong glass tube if we fill it with water and discharge a jar by means of two wires whose extremities are placed in the water, at a short distance from one another. The tube bursts, even if one end be left open, thus showing that the extreme suddenness of the explosion makes it act in all directions, and not solely in that of least resistance. When we think of the danger of leaving, even a few drops of water in a mold into which melted iron is to be poured, we shall find no difficulty in thus accounting for the violent disruptive effects produced by lightning. Heated air is found to conduct better than cold air, probably on account of the diminution of density only. Hence we can easily see how it is that animals are often killed in great numbers by a single discharge, as they crowd together in a storm, and a column of warm air rises from the group. Inside a thunder cloud, the danger seems to be much less than outside. There are several instances on record of travelers having passed through clouds from which, both before and after their passage, fierce flashes were seen to escape. Many remarkable instances are to be found in Alpine travel, and specially in the reports of the officers engaged in the survey of the Pyrenees. Several times it is recorded that such violent thunder-storms were seen to form round the mountain on which they were encamped, that the neighboring inhabitants were surprised to see them return alive. Before the use of lightning rods on ships became general, great damage was often done to them by lightning. The number of British ships of war thus wholly destroyed or much injured during the long wars toward the end of the last and beginning of the present century, is quite comparable with that of those lost or injured by gales or even in battle. In some of these cases, however, the damage was only indirectly due to lightning, as the powder magazines were blown up. In the powder magazine of Brescia, in 1769, lightning set fire to over 2,000,000 pounds of gunpowder, producing one of the most disastrous explosions on record.—*Nature.*

Self-Control in Society.

Good breeding gives us certain definite rules; and, while these are observed, society is possible, else it disintegrates. But we may, without losing self-respect, exercise a vast self-control, and not show that we distrust people, nor that we vastly like them: we need not wear our hearts on our sleeves for daws to peck at. Members of the same family should never quarrel in public. This is often done by two sisters of uncertain tempers, and the crowd laughs. The French have a proverb about this, perhaps too well known to be quoted.

Never show that you feel a slight. This is worldly wise as well as Christian;

for no one but a mean person will put a slight upon another, and such a person always profoundly respects the person who is unconscious of his feeble spite. Never resent publicly a lack of courtesy. It is in the worst taste. What you do privately about dropping such an acquaintance, must be left to yourself.

To a person of noble mind, the contests of society must ever seem poor and furious, as they think of these narrow enmities and low political maneuvers; but we know that they exist and that we must meet them. Temper, detraction, and small spite are as vulgar on a Turkey carpet and in a palace as they could be in a tenement house; nay, worse, for the educated contestants know better. But that they exist we know as well as we know that the diphtheria rages. We must only reflect philosophically that it takes all sorts of people to make a world; that there are good people, rank and file; that there is a valiant army and a noble navy; that there are also pirates who will board the best ships, and traitors in every army, and that we must be ready for them all; and that, if we live in a crowd, we must propitiate that crowd.

Never show a fractious or peremptory irritability in small things. Be patient if a friend keeps you waiting. Bear, as long as you can, heat or a draught, rather than make others uncomfortable. Do not be fussy about your supposed rights: yield a disputed point of precedence. All society has to be made up of these concessions: they are your unnumbered friends in the long run.

We are not always wrong when we quarrel; but if we meet our deadliest foe at a friend's house, we are bound to treat him with perfect civility. That is neutral ground. Never, by word or look, disturb your hostess: this is an occasional duplicity which is ordered by the laws of society. And, in all honesty, cultivate a graceful salutation, not too familiar, in a crowd. Do not kiss your friend in a crowd: be grave and decorous always. Burke said that manners were more important than laws. "Manners are what vex or soothe, comfort or purify, exalt or debase, barbarize or refine us by constant, steady, uniform, insensible operation, like the air we breathe."

A salutation may have a great deal of meaning in it. It may say, "I respect you, and I wish you well." It may say, "I love you;" it may say, "I hate you." In a crowd, it should simply say the first. The bow of a young lady should be maidenly, quiet, not too demonstrative, yet not cold nor forbidding. The salutation of a man to a woman cannot be too respectful. It is to be feared that "old-fashioned courtesy" has no place in our fashionable society. There is either coldness or too great familiarity.

The manners of young women are apt to be too careless. They emulate the manners of men of the age too much, not remembering that they should carry in their gentle ways the good manners of all ages. She should remember that when a woman's salutation ceases to be delicate, elegant and finished, she steps down from her throne and throws away her scepter. There is no salutation, however, more displeasing than that of a too efflorescent and flattering subservancy. "He bows too low," should never be said. Avoid being a snob, in private, as in a crowd.—*American Etiquette in Andrews' American Queen.*

KANSAS has already begun to reap benefits from its vast immigration the past two years. Diversified farming has greatly increased. While the grain and live-stock interests are the predominant ones of the State, the other branches of agriculture are looked after more closely than heretofore.

Our Exchanges.

E. C. Rankin has purchased 40,000 sheep and put them on his farm south of the river. —*Great Bend Register.*

Rice corn is proving itself to be all that has been said for it. The heads are quite full and fast ripening. Horses prefer it to millet, and chickens and hogs devour it rapidly.—*WaKeeney World.*

A colored man in Graham county has, during the summer, spaded a four-foot hedge-row around his farm of 160 acres; and another colored man in the same vicinity has a cow with which he broke twelve acres of prairie and cultivated eight acres of corn. —*Jewell County Review.*

The U. P. Railway are fencing in their track and right of way, as is the custom of eastern railroads. Starting out westward from the Missouri river, they are erecting a galvanized, three-wire, barbed fence, with cedar posts, on either side of the 100 feet of right-of-way, and in due course of time will have the entire line fenced.—*Kansas Valley Times.*

A convention of the wool-growers of the State will be held in Junction City on the 12th of October. A convention of county surveyors and civil engineers will also be held here on the 20th of October. Next year the State convocation of the Knights of Pythias, and the diocesan convention of the Episcopal church of Kansas, will be held here. Let it not be forgotten that we are to be the convention city of Kansas.—*Junction City Union.*

Ashes in nearly all soils are beneficial. Their action is manifold: they supply plants with inorganic elements which they require; they neutralize acids; and they act chemically as solvents upon other salts in the soil. They are more beneficial on sandy, gravelly soils than on clay. For plants that require a large amount of potash and phosphoric acid, as carrots, turnips, onions, potatoes, and cabbages, ashes are an essential manure.—*Cincinnati Grange Bulletin.*

C. G. Scrafford attended the final meeting of his creditors at Topeka last week. He states that the assignee in bankruptcy, G. W. Williams, has paid out of the fund realized from the sale of Mr. Scrafford's property about \$6,000 towards liquidating the claim of the State against Samuel Lappin; and that he now has money enough on hand, after paying the enormous expenses attendant upon the settlement of an estate in bankrupt court, to pay the creditors about 25 or 30 cents on the dollar. Mr. Lappin's property, when sold, fell \$6,000 short of paying the State's claim against him of \$18,000.—*Nemaha County Republican.*

The loss of cows and other cattle in and around the city, and in the country, is assuming large proportions. In the country the loss is confined principally to the section through which the old cattle trail to Caldwell runs. The exact character or name of the disease is not certainly known; but it is generally believed to be what is called Texas or Spanish fever, and that it has been disseminated by a lot of cattle said to have been driven through after night, and shipped from our stock-yards. We cannot approximate to the number of head that have died; but the sickness has been prevailing for several weeks, and we hear daily of stock having died. A number of cows have died in this city and across the river, where the disease seems first to have made its appearance. One stock-man in Ohio township is said to have lost fourteen head. We suppose every precaution will be used to prevent further ravages. It is fortunate that frost, which kills the Texas fever, is not far off.—*Wichita Beacon.*

THE INDUSTRIALIST.

SATURDAY, OCTOBER 9, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE *Kansas Agriculturist*, referring to our comments on the statement of its editor that he had seen with the Riley county exhibit at Bismarck a "large quantity" of articles belonging to the College, does the fair thing, as follows:—

"Since reading the above, we have conversed with others, and find that they were under the same impression as ourselves, as to having seen some of the same things at the College that were seen in the Riley county display. The word of the gentlemen from Riley convinces us that we were mistaken. It was an honest mistake upon our part. We do not hesitate to correct any error that we may fall into, when our attention is called to it. * * * Will the *INDUSTRIALIST* please copy this from the *Kansas Agriculturist*?"

At this season of the year, when vegetation is scant, and pastures, by a rapid transition, pass from short to none at all, a little grain fed to cattle or swine will give better returns than when fed at any other season. The object of the stockman at this season ought to be to preserve the flesh made on the abundant summer pastures. But this he cannot do without extra feed, either in the shape of grain or hay. With the majority of Kansas stock-raisers, cattle and swine will fare meanly enough during the next two months; and after that, grain will be showered upon them in the most wasteful fashion.

At a meeting of the Kansas Breeders' Association, held last winter, a large stock-raiser made the statement that he knew, from careful weighing, that during the month of September his steers had shrunk from fifty to sixty pounds when depending on the range alone. Let any one estimate the amount of grain this fifty or sixty pounds of beef, and the consequent enhanced value of the whole animal, would pay for.

The Fair Question.

The development of an agricultural country depends upon the thoroughness of the cultivation and the quality of the seed planted. Of a number of farms of the same quality of soil, that farmer will raise the best crops who obtains the best seed and cultivates in the best time and manner. The financial interests of any stock-raising country are promoted by obtaining the best breed of stock, and by taking proper care of them. Now, there is no question but that fairs do stimulate the development of the resources of a country. The farmer that looks upon the grain, or the fruit, or the vegetables raised, by one of his neighbors who has succeeded better than himself, cannot but be filled with some desire to do better work in the future than he has in the past,—to learn how his neighbor has thus succeeded, and to try to imitate, in some degree, his success. The raiser of stock who looks upon well-formed animals, must admire them; and, if he is assured that a man will receive better returns for his labor in raising a better breed of animals, and in caring for them more attentively, he will be induced to improve the quality of his own stock. Fairs encourage some men to bring into a country animals of a fine quality: the presence of these induces other men to improve their stock, and the general grade is raised, by this means, several degrees. Manufactured articles, specimens of handiwork, and examples of the fine arts, which are exhibited at these fairs, also do something toward cultivating a

higher civilization among the people.

Fairs are also valuable for cultivating the social element among the people. We of this western country are so occupied with business that we do not take time to be social with our neighbors; and many of our old acquaintances we have not seen for a year or more, though they live not more than five or ten miles distant, but when the fair comes round, we have an opportunity of meeting them again. It does us good to give them a hearty shake of the hand and say, "How are you?"

But there is another side to this question. Are not fairs, as they are now conducted, demoralizing in their influence upon society? There is perhaps nothing which tends more to take the manhood out of a man than the principle of trying to get something for nothing,—to obtain money without rendering any equivalent. Every element of gambling saps the foundation of good society. He who wins from his neighbor without giving a return, parts with that which is infinitely more valuable, character. I love to see a fine and noble horse: I like to see him trot; but the trotting, as it is conducted at our State and county fairs, is nothing more nor less than a gambling game. Five men each enter a horse to trot for a premium of fifty dollars: each is charged ten dollars as an entrance fee. Now this is simply saying, "I'll bet ten dollars against forty that my horse will win." Interested parties stand ready to bet on one or another of their favorite horses; and so the gambling goes on.

This is only the high school of which the primary and intermediate departments are a short distance outside the track. The primary department is the shooting gallery, or something of the same nature. Two shots for a nickel. A boy bets two and a half cents with his companion that he can beat him shooting: the winner takes back his two and a half cents, and the loser pays the nickel. The intermediate department is the "wheel of fortune," or some other instrument its equal. The young man steps up and lays down his dime or quarter on one of six numbers: the wheel is turning, and may stop at any one of the six numbers. Thus he stands five chances of losing his money, to one of winning four times his money. The odds are plainly and clearly against him; but the hope of luck lures him on until his money is gone, and with it an inestimable damage to his character. Graduating from this department, and obtaining more money, he is prepared for the larger gambling of the race-track. It is clearly a crime for the managers of fairs to license these schools of vice upon their grounds. Suppose a "wheel of fortune" man does offer to pay into their treasury three to five hundred dollars, that same money and more too must come out of the pockets of the young men; and, what is worse, the character from their manhood, without giving them any return.

You say a young man is not obliged to be fool enough to do this: true, neither is he obliged to go into a licensed liquor saloon; but the temptation is placed before him, he does it, and money and manhood are gone. Mr. Long, the reformed gambler of Illinois, testified, at the Bismarck camp-meeting, to the terribly debasing influence of the race-track upon the morals of the country.

It is said that the gate fees of fairs will not pay the expenses, without the attraction of the track. If this is so, I see no good reason why a reasonable premium might not be offered by the society for the fastest trotter, without charging an entrance fee,

and open to all; then, although outside betting could not be entirely stopped, it would not be a regular gambling school, based upon gambling principles. But, if we cannot have an exhibition of the products and resources of a county or State without these schools of vice, we had better close up. The morals of a community are of more importance than Berkshire pigs.—*Prof. Platt.*

Students Enrolled Since Sept. 9, 1880.

Adams, Emma L.	Manhattan, Riley.	Johnson, J. L.	Wauhsara, Lyon.
Allen, Edgar	Beloit, Mitchell.	Kay, Thos. O.	Olesburgh, Pottawatomie.
Allen, J. Chester	"	Kern, E. H.	Ionia, Jewell.
Allis, Ada	Virgil, Greenwood.	Kingsbury, E.	Burlington, Coffey.
Allis, Emmet	"	Knaus, W.	Buffalo, Wilson.
Anderson, Edwin C.	Manhattan, Riley.	Lamer, Ray L.	Lindsburg, McPherson.
Anderson, Luella	"	Leach, D. S.	Beloit, Mitchell.
Andress, Emert	Hanover, Washington.	Lender, Jno.	Manhattan, Riley.
Bacheller, Viola	Lanark, Rush.	Lewis, Issie	"
Bailey, Chas. F.	Weir City, Cherokee.	Lewis, J. W.	"
Bailey, Lambert	Toledo, Chase.	Lewis, M. M.	Stockdale, Riley.
Bailey, Nora	"	Lightfoot, Hattie	Jewell City, Jewell.
Barrett, Chas. F.	Greenleaf, Washington.	Lightfoot, W. J.	"
Bayles, Rachel	Manhattan, Riley.	Litson, A. D.	Benton, Butler.
Bayles, Wm.	Garrison, Pottawatomie.	Long, Cora B.	Ellsworth, Ellsworth.
Berry, J. W.	Jewell City, Jewell.	Long, Georgia	"
Berry, Sam'l B.	Bryant, Butler.	Lucas, Alma	Menoken, Shawnee.
Blades, Hattie	Junction City, Davis.	Lund, Jacob	Bismarck, Wabaunsee.
Boles, Geo. W.	Baxter Springs, Cherokee.	Mackey, Angie	Junction City, Davis.
Boutwell, L. T.	Wakefield, Clay.	Mackey, Ella	"
Bower, Mary	Manhattan, Riley.	Mails, Mattie	Blue, Pottawatomie.
Bowen, Thos. P.	Garnett, Anderson.	Markcum, Katie	Elkhart, Polk, Iowa.
Brady, J. E.	Leavenworth, Leavenworth.	Markcum, M. H.	Winfield, Cowley.
Branch, A. C.	Sterling, Rice.	Marlatt, Chas.	Manhattan, Riley.
Breakbill, J. J.	Manhattan, Riley.	Mason, Dalinda	Delphos, Ottawa.
Brown, G. H.	Wakefield, Clay.	McConnell, May	Menoken, Shawnee.
Brown, Grace A.	Manhattan, Riley.	McConnell, Geo. G.	"
Browning, G. A.	"	McElroy, J. C.	Alma, Wabaunsee.
Brumbaugh, Fidelia	Madison, Greenwood.	McElroy, Libbie A.	"
Bryson, J. T.	Cheever, Dickinson.	McElroy, Margery	"
Buchli, B.	Bismarck, Wabaunsee.	McGuire, Katie I.	Manhattan, Riley.
Call, H. L.	Wildcat, Riley.	McHenry, W. J.	Medina, Jefferson.
Calvin, V. H.	Manhattan, Riley.	McKerlie, Chas.	Sturgis, Michigan.
Campbell, B. G.	Manhattan, Riley.	McMullen, O. A.	Boston Mills, Cherokee.
Campbell, Emma	"	McNair, Alice	Ashland, Riley.
Campbell, May	"	McNair, J. L.	Ashland, Riley.
Chenoweth, J. W.	Baxter Springs, Cherokee.	Meacham, Laura	Zeandale, Riley.
Clark, F. C.	Solomon Rapids, Mitchell.	Meek, W. H.	Galva, McPherson.
Clayton, Adella	Solomon City, Dickinson.	Miller, Thos. W.	Peach Grove, Clay.
Clayton, Florence	Bennington, Ottawa.	Moore, A. R.	Chapmanville, Clay.
Clothier, G. L.	Alma, Wabaunsee.	Moore, D. J.	"
Coburn, Jennie	Salina, Saline.	Myers, W. S.	Iola, Allen.
Conklin, G. B.	Whiting, Jackson.	Needham, Dana	Lane, Franklin.
Cope, Chas. M.	Emporia, Lyon.	Neiswender, L. H.	Silver Lake, Shawnee.
Copley, John T.	Perry, Jefferson.	Nelson, L. T.	Wakarusa, Shawnee.
Coran, Riley W.	Ft. Scott, Bourbon.	Noland, Manda	Manhattan, Riley.
Corey, W. A.	Plowboy, Shawnee.	Noland, Mary	"
Cotton, Geo. W.	Rural, Jefferson.	Noyes, Amy	Pavilion, Wabaunsee.
Cottrell, H. M.	Wabaunsee, Wabaunsee.	Noyes, A. L.	"
Cowell, Julia E.	Wakefield, Clay.	O'Meara, Carrie	Onaga, Pottawatomie.
Cranford, Ida	Brookville, Saline.	Paine, E. C.	Ivy, Lyon.
Culter, W. H.	El Paso, Sedgwick.	Palmer, O. G.	Jewell City, Jewell.
Donaldson, A. J.	Chelsea, Butler.	Palmer, W. C.	"
Donaldson, Carrie	Manhattan, Riley.	Patterson, Anna	Manhattan, Riley.
Donaldson, Flora	Chelsea, Butler.	Peck, Geo. C.	Junction City, Davis.
Donaldson, Florence	Manhattan, Riley.	Peck, Hattie	"
Donaldson, Geo. T.	Chelsea, Butler.	Peck, S. N.	"
Drummond, Rob't H.	Woodhull, Chase.	Peckham, Allie	Manhattan, Riley.
Dunn, F. W.	Waterford Mills, Indiana.	Pence, C. S.	North Topeka, Shawnee.
Evans, H. S.	Rural, Jefferson.	Pence, Ida	"
Failyer, Ida	Sedan, Chautauqua.	Phillips, Wm.	Garrison, Pottawatomie.
Fairchild, Agnes M.	Manhattan, Riley.	Platt, E. M.	Manhattan, Riley.
Fairchild, Edwin M.	"	Poirier, Edward A.	Wathena, Doniphan.
Ferguson, Ida	"	Poirier, Lawrence	"
Fisher, Mary	Empire Prairie, Missouri.	Pope, Gracia	Wichita, Sedgwick.
Fisher, Julia Y.	Whitesville, Missouri.	Pound, E. L.	Manhattan, Riley.
Foreman, Albert	Randolph, Riley.	Pringle, J.	Harveyville, Wabaunsee.
Fowler, G. W.	Medina, Jefferson.	Prothrow, J. H.	Wilmington, "
Freeman, J. D.	Jewell City, Jewell.	Quinby, May V.	Wakefield, Clay.
Gamble, R. K.	Wakarusa, Shawnee.	Randall, John W.	Winfield, Cowley.
Gemeny, Bessie	Junction City, Davis.	Roush, A.	Wilmington, Wabaunsee.
Glossop, Emma	Manhattan, Riley.	Reeve, Mark A.	Americus, Lyon.
Griffing, Mary	"	Richards, Bettie	Moodyville, Pottawatomie.
Haines, Phoebe	"	Richards, Wm.	"
Hall, Frank	Lyons, Rice.	Richardson, F. E.	Wauhsara, Lyon.
Hamilton, J. W.	Florence, Marion.	Rogers, J.	Hanover, Washington.
Harvey, Emma	Vinton, Riley.	Rorick, Wm.	Perry, Jefferson.
Haworth, A.	Boston Mills, Cherokee.	Sampson, Clara	Sulphur Mills, Dickinson.
Helmick, A. L.	Weir City, "	Selby, Belle	Garnett, Anderson.
Helmick, Eli A.	"	Selden, Kate	Wabaunsee, Wabaunsee.
Hodges, Charles	Winfield, Cowley.	Shanks, G.	"
Hollenberg, R. A.	Hanover, Washington.	Short, B. L.	Crestline, Cherokee.
Hopper, Geo. E.	Downs, Osborne.	Short, Emma L.	Manhattan, Riley.
Hopper, Lucy	"	Short, Helen M.	Crestline, Cherokee.
Horning, G. L.	Grantville, Jefferson.	Sloan, Fannie	Wakefield, Clay.
Horning, H. J.	"	Snow, Cora	Manhattan, Riley.
Houston, Chas. E.	Elmdale, Chase.	Strong, Grace	"
Houston, Hortense	Manhattan, Riley.	Stuart, Jerome	"
Houston, U. G.	"	Swingley, S. N.	Turner, Wyandotte.
Howard, Hattie	Kingsville, Shawnee.	Thompson, J. B.	Ingalls, Lincoln.
Hunt, Anna	Columbus, Cherokee.	Thrasher, Mira	Manhattan, Riley.
Hunting, Cora	Manhattan, Riley.	Treyor, W. M.	Detroit, Michigan.
Hunter, Hattie L.	"	VanFossen, Wm. C.	Leavenworth.
Hutto, E. M.	"	Wahl, F. E.	Manhattan, Riley.
Hutto, F. A.	"	Walden, Ella	Manhattan, Riley.
Jeffery, F. M.	Zeandale, "	Walden, Sarah	King City, McPherson.
Jeffery, W. J.	"	Walden, W. S.	Manhattan, Riley.
		Waltrip, M. H.	Cheever, Dickinson.
		Ward, E.	North Topeka, Shawnee.
		White, Beatrice	Manhattan, Riley.
		Whitney, Bertha	"
		Willard, J. T.	Wabaunsee.
		Wilmarth, Frank	Lincoln, Lincoln.
		Woods, A. O.	Wellington, Sumner.
		Wyland, Jeanette	Jewell City Jewell.
		Wyland, J. W.	"
		Wylie, C. C.	Tabor, Clay.
		Young, E. B.	Salina, Saline.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 9, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

The familiar features of Mr. Augustine Beacham, B. S. of last Commencement, might have been seen on the Hill yesterday.

Among the visitors of the week, we have to mention the names of Regent E. B. Purcell, Manhattan; Joab Mulvane, Topeka; Capt. Henry Booth, Larned; and Mr. Giles, of Irving.

A considerable force of students is hard at work these fine days hauling manure into the field: a job, by the way, which the average Kansas farmer, much to his detriment, does not often set himself about.

Husking corn on the farm has fairly commenced. The crop is quite satisfactory; but we notice that the corn is quite loose on the cob, from which we infer that the yield in shelled corn will be considerably less than is indicated by the number of bushels of ears.

The statement made in these columns two weeks ago that seventy-two of the ninety-seven new students then admitted, or 74 per cent, are the sons and daughters of farmers, shows something of the estimation in which this College is held by the class which agricultural colleges were designed to benefit.

An examination of the list of students and the grouping by counties, is invited; and, if it occurs to any friend that his county is not sufficiently represented at the Agricultural College, we offer for his consolation the fact that room will be found for a number of more bright boys and girls, if he shall see fit to set himself and send them along.

During the fore part of the present week, Prof. Failyer, assisted by several of our students, unearthed the Elephas Primigenius discovered by S. C. Mason. It was thirty-four feet under the surface. Its tusks were over nine feet long; and its teeth, four of which were secured, were fifteen inches in length and eight inches in depth. Further particulars crowded out this week.

The public exercises of yesterday afternoon consisted of orations by the first division of the Senior Class. The speakers and subjects were as follows: F. M. Jeffery, "Credit, its uses and abuses;" W. J. Jeffery, "One purpose in life;" D. S. Leach, "Drouth in Western Kansas;" W. S. Myers, "Swimming against the stream." These subjects were treated in a practical way, and the efforts were creditable to the young men.

Hon. John A. Anderson, ex-President of this College and now M. C. from this District, favored us with a three-hours' visit yesterday. After chapel exercises, in his big, whole-hearted, inimitable fashion, he gave the students a ten-minutes' talk, which put every one in the very best state of good humor. Then he took a stroll about the grounds and over the farm; meanwhile applauding the changes made in the grounds and buildings, praising the Short-horns, and offering many shrewd suggestions. On taking leave, he declared that he had spent a very pleasant half-day, as certainly we all had.

After listening to the profound utterances of a few of the Seniors, we adjourned to the Society room to find it filled with Alpha Betas and their visitors. President Lightfoot was absent, and Vice-President Jeffery presided. Misses Lightfoot, Cowell, and Selden, and Mr. Young, were initiated. Twice during the session we were favored with musical selections by our able music committee. It is to this order that the Society owes much of its prosperity with the students. A carefully prepared number of the *Gleaner* was presented by W. J. Jeffery and Jennie E. Coburn.

The debate, conducted mainly by new members, plainly showed that we have in our Society those who, by a little practice, will become excellent speakers. Debate next week will be conducted by Messrs. Hutto, Helmick, Hopper and Clothier. We shall have the usual orders of declamation, essay, and select reading. We still urge new students to come and see us. We will make room for you, even if we have to bring in extra benches.

A. B. QUILL.

The College stock seems to meet with favor on all hands; and, besides the favorable notice it has received at the fairs, we have received several very pleasant letters from old customers. We give extracts from the lately received. A gentleman from Ottawa county writes: "The boar that you shipped us has done finely. Have you another one of the same age that you can spare?" Another customer, writing from Anderson county, says: "The pigs arrived at Colony last Friday in excellent condition. We are entirely satisfied with them, and consider them, not only good specimens of the breed, but also a credit to your establishment."

There are indications, as we go to press, that the "domestic science club" is "agitating" some momentous questions. From the kitchen laboratory adjoining this office, there issues a steady but constantly increasing volume of female voices, which threatens shortly to drown the sound produced by our compound engine and double, back-acting, reversible Gordon job press. But we believe in the domestic science club: nay, we are persuaded that bad dinners, with buttonless shirts and dirty-faced babies, will shortly disappear from this section; and hereafter we may expect that Riley county will as easily take the prizes at the fairs for "the best-kept husband" and "prettiest baby," as she now wins with plethoric Short-horns and very long corn.

So far, 205 students, coming from 39 Kansas counties and 4 States, namely, Michigan, Iowa, Indiana, and Missouri, have been enrolled this term. Below we give the representation from each county and State:—

Allen.....	1	Marion.....	1
Anderson.....	2	McPherson.....	3
Bourbon.....	1	Mitchell.....	4
Butler.....	5	Osborne.....	2
Chautauqua.....	1	Ottawa.....	2
Chase.....	4	Pottawatomie.....	7
Cherokee.....	10	Rice.....	2
Clay.....	9	Riley.....	56
Coffey.....	1	Rush.....	1
Cowley.....	3	Saline.....	3
Davis.....	7	Sedgwick.....	2
Dickinson.....	4	Shawnee.....	11
Doniphan.....	2	Sumner.....	1
Ellsworth.....	2	Wabausee.....	15
Franklin.....	1	Washington.....	4
Greenwood.....	3	Wilson.....	1
Jackson.....	1	Wyandotte.....	1
Jefferson.....	8	Indiana.....	1
Jewell.....	9	Iowa.....	1
Leavenworth.....	2	Michigan.....	2
Lincoln.....	2	Missouri.....	2
Lyon.....	5		

WEATHER REPORT FOR SEPT., 1880.

The month of September is noted for no remarkable peculiarities. The temperature was somewhat lower than the average. The mean temperature was 64°.91. The mean temperature of the month for the last twenty years is 67°.37.

Mean temperature at 7 A. M.....66°.00.
" " 2 P. M.....73°.80.
" " 9 P. M.....63°.03.

The maximum temperature of the month occurred on the 18th. The mercury then stood at 86°. The warmest day was the 5th, the mean temperature being 75°.25.

Maximum temperature at 7 A. M.....73°, on the 5th.
" " 2 P. M.....86°, on the 18th.
" " 9 P. M.....75°, on the 24th.

The lowest temperature of the month, 40°, was on the 29th. The 26th was the coldest day: mean for the day, 52°.25. The range for the month was 46°.

Minimum temperature at 7 A. M.....44°, on the 29th.
" " 2 P. M.....61°, 22d and 26th.
" " 9 P. M.....49°, on the 26th.

Light frost appeared on straw and other good radiators, on the mornings of the 13th, 14th, 27th, and 29th; but there was not sufficient freeze to injure vegetation.

Highest barometer.....28.95 on the 29th.
Lowest ".....28.36 on the 25th.
Mean ".....28.68.

A measurable amount of rain fell on the following days: 2d, .28; 3d, 1.06; 6th, .11; 7th, .05; 19th, .18; 21st, .62; 25th, .22. Total rainfall, 2.52 inches. The average precipitation for September is 3.23 inches.

Per cent of cloudiness, 7 A. M., 3.5; 2 P. M., 3.6; 9 P. M., 2.9. Direction of wind preceding rain: S., four times; E., 2; SW., 1. Direction of wind during rain: E., 4; SE., 2; N., 1. Direction of wind following rain: NW., 3; N., 1; SW., 1; SE., 1; E., 1.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses. Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for

absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. WM. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WARREN KNAUS, President.

GEO. F. THOMPSON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations. I. D. GRAHAM, President.

G. H. FAILYER, Secretary.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. S-37t.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange are issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Special for Women.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 9, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying out fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE.

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE.

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings, Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

M. Lopez.
B Adams



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Address A. A. STEWART, Manhattan, Kas.

AGRICULTURAL COLLEGE.

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Mrs. M. E. CRIPPS, Sup't Sewing Department.
W. L. HOFER, Teacher of Instrumental Music.

THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Financial Education.

The success which various crazes about finance have had during the past fifteen years, has furnished the text for much unfavorable criticism of the education given in both the common and high schools of the country. There is probably nothing which a young person, who has either to earn money for himself or keep money which he has inherited, so much needs to understand as the conditions on which what is called "business" is carried on. As soon as the arts of reading and writing are acquired, there is no part of a child's equipment for the work of life so valuable both to himself and to the rest of the community as clear comprehension of what money is; of what interest is; of the ways in which money can be made to produce interest; of the ways in which it is lost; of the various apparently honest devices by which sharpers, both political and private, get hold of other people's money; of the functions of banks, and especially of savings-banks, with regard to money; and of the relation of taxation to profits, and of currency to prices. Knowledge of this sort to ninety-nine boys and girls out of a hundred is the first essential of any education intended to fit them for a life of self-dependence, and for the expression at the polls of a safe or even harmless opinion on public affairs.

When it was discovered a year ago that thousands of poor Irishmen and Irishwomen had been entrusting their hard earnings to the care of an archbishop who knew nothing of investments, and kept his accounts on scraps of paper, and had been drawing interest from him for years without enquiring or caring how he produced it, there was a great deal of pity expressed for their ignorance and superstition. But they could not have been expected to know better. They had not been bred in a commercial community. Most of them, doubtless, had never been to school, and could not conceive of anybody's being fitter to take care of their money than a person who they knew would not wilfully cheat them. But we venture to say that neither their ignorance nor credulity came anywhere near matching those of the depositors in a savings-bank in Boston, the operations of which the *Daily Advertiser* of that city has been exposing within the last week. The obvious moral of the affair is, as it seems to us, though the Boston press has not yet drawn it, that there is something sadly defective in the education furnished by the State to the children of the tax-payers, when any class of the community, intelligent and industrious enough to have savings, is capable of being made the victims of so coarse and gross an imposture as this one. A woman named Howe, who now has a third husband, the other two still living,—who has passed two years in a lunatic asylum, has been convicted and imprisoned for fraud, for some time followed the trade of an itinerant clairvoyante or fortune-teller, and has once or twice changed her name, set up a savings-bank under the name of the "Ladies' Deposit Company." Of course, her antecedents as given above were not known; but this means that nothing was known about her to those who were invited to give her their money. These were single women or widows earning their own living, or the wives of sick or decrepit husbands. No deposit over \$1,000 was to be taken. All money was to be withdrawable on call. No name appeared in the prospectus or title of the institution. No guarantee of any kind was offered as to its responsibility or solvency. No explanation was made of its operations, or of the nature of its investments, or of the source from which it was to derive the interest on its deposits. Nor did the founder, unknown and characterless as

she was, even take the precaution to offer a moderately high rate of interest, such as is actually paid in some parts of the country on bona fide investments, such as eight, or ten, or twelve per cent, or even two per cent a month. She actually had so much contempt for her possible clientele,—that is, the working-women of the State in which the standard of female education and intelligence is supposed to be highest,—that she offered eight per cent a month, and three months' interest at this rate in advance, when the deposit was made. That is to say, a woman depositing one hundred dollars received back at once twenty-four dollars, had one hundred dollars placed to her credit, and three months later was to be entitled to twenty-four dollars more. So that at the end of the year she would have drawn ninety-six dollars as interest, or within four dollars of the total amount of her principal.

Mrs. Howe seems to have been correct in her calculations. Deposits poured in as fast as she could take them, and the concern has actually been flourishing ever since its foundation. When the *Advertiser's* exposure came, it had crowds of depositors, and plainly of the higher and more intelligent class of female workers, because only this class can have money. It has been ascertained, indeed, that a considerable number of them are teachers in the public schools, presumably good classical scholars and mathematicians, and full of history and belles-lettres. More extraordinary still, although the exposure of course brought a run on the bank, it did not, and up to this writing has not, stopped the flow of deposits. There are apparently considerable numbers of women who look on the exposure as a device of the State-Street bankers and brokers to get rid of a troublesome rival, whose generous methods brings out their own greed and heartlessness in stronger relief. To crown all, Mrs. Howe, even under the fierce light of publicity, gives no account of what she does with the money, beyond the clumsy pretense—probably as clumsy as was ever produced by a pickpocket in a police court—that she has been made the almoner of a huge charity, which enables her to lose money for the benefit of poor working-women who have saved a little. She must, even with her experience of human credulity, be astonished by her success. She cannot have expected to find women so gullible as to enable her to purchase, as she has just done, a house for forty thousand dollars after two years' operations.

Now, consider the childlike ignorance and simplicity which this extraordinary story reveals on the part of a most useful, intelligent, and saving class,—many of them, too, the teachers of children,—with regard to the commonest phenomena of trade. In the first place, they apparently know nothing of the conditions which regulate the ordinary rate of profit, even in hazardous enterprises. If they did, they would see that a proposal to pay them in Massachusetts ninety-six per cent per annum, for the use of money, was either on its face a swindle, or a charity on a scale which nothing but the revenues of a nation could keep going very long. They are totally ignorant of the conditions which make an investment safe, and of the effects of safety on the rate of interest. Moreover, they apparently have no notion of the necessity, which is one of the most prominent facts of commercial history, of exacting security for the return of money lent. They do not know why business men, in good standing, exact it of each other; and why the Government exacts it of banks; and why banks exact it of their customers. Nor have they enough perspicacity to see that Mrs. Howe is simply paying the early depositors with the funds supplied by the later ones; and that,

if there should be any cessation in the flow of deposits, or any extraordinary run on the concern, it must burst at once: or enough acquaintance with financial history to know that this is an old and familiar swindle,—one of the oldest in the history of crime. The new feature which Mrs. Howe has added is the selection of women, and single women, as victims. All the rest is very stale and dull and commonplace.

The Boston papers say the bank commissioners and the district attorney are studying Mrs. Howe's case to see if they can get hold of her under the law but thus far without success. To our minds, the matter is one which merits the attention of the school boards, much more that that of the bank authorities or prosecuting officers. It is the school system which supplies people like Mrs. Howe with their prey. No system of education can prevent all fraud. Many frauds are so ingenious that the most cautious and expert business men are imposed on by them. Others, even if clumsy, will find occasional dupes among the unwary and inexperienced. But here is one of the clumsiest frauds ever attempted, with its true character apparent on its prospectus, with all the old and well-known marks of fraud, indifferent to all the ordinary precautions and disguises; and it finds its dupes among a large and highly respectable and most deserving class, of more than ordinary timidity and thrift, and more than ordinarily weighed with care. What is more remarkable than all this, that large numbers of them are said to feel outraged by the suspicions and denunciations of Mrs. Howe by those who have had most experience of the conditions under which safe banking is done; and they have not heard of, or do not attach any importance to, the security for the safe transaction of business which the State exacts of its savings-banks. —*The Nation*.

Our Exchanges.

The first car of new corn received at St. Louis, arrived on Monday from Neodesha, Kansas. It graded No. 2, and was sold at 41½ cents.—*Champion*.

Mrs. Lydia J. Kemp and son, two and one-half miles southeast of Industry, has sown 500 acres of fall wheat,—200 acres on her own farm and 300 on leased land.—*Abilene Gazette*.

To accustom the young to be and to do, is even more important than to induce them to learn and to know. What they think out of their own thoughts and work out with their own hands, is worth far more to them than any amount of passive reception of other men's thoughts or doings, even through the very best books or the very best teachers. Let the child feel, not merely that he is preparing for something in the future, but that he is also living a true and real life in the present, taking his own share of work and responsibility, strengthening his powers by continual action, and building up his character by continual well-doing.—*Clay Center Dispatch*.

Mr. Geddes spoke of the economy of buying sections of old steam boilers for farm rollers, which can easily be fitted with skeleton heads, and can be bought cheap and answer the purpose. Mr. Geddes related his experience in rolling wheat on certain soils containing clay, where fall rolling causes the formation of scale that eventually kills the wheat. On sandy or light soils, fall rolling is generally advisable. A roller is a dangerous tool in inexperienced hands. He gives the following rules: Roll soil that you want compact; but if not, let it alone: never roll in wet weather. Clay soils may be rolled in the spring, but not in the fall. —*Syracuse Journal*.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 16, 1880.

H. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

An Elephas Americanus.

During the forepart of last week, a portion of the skeleton of an elephant was unearthed in the ravine just north of Bluemont. The ravine, at the place where the discovery was made, is forty-three feet deep. The skeleton was nine feet and six inches from the bottom of the ravine, and thirty-three feet and six inches from the surface level. The whole of this formation, which, perhaps, has much greater depth, is a fresh-water deposit. The tusks were lying on the side, so to speak, with the convex portion of the curve toward the ravine. When first discovered, by Mr. S. C. Mason, the middle portion of one tusk was broken away by the caving of the bank, the two extremities being still imbedded in the stiff clay.

The texture of the fragments at the bottom of the gulch, although so far decayed as to be perfectly friable, revealed to the observing student the kind of object with which he had to deal. After making a minute examination of the exposed portions of the tusk, of the clay surrounding it, and of the formation above, he sought aid in removing it. The writer was requested to take charge of the work. We very carefully removed the clay from about the portions still intact, and made complete measurements before disturbing them. The length of this tusk was nine feet and six inches. The transverse section of the tusk was an oval. The longer diameter of the butt was eight and a quarter inches; the shorter, seven inches. It was very fragile, and would not bear handling.

Parallel with this tusk, and about two feet further in the bank, the mate was found. It was a magnificent specimen, as it lay exposed, when the dirt was removed from about it. Although much better preserved than its fellow, it could be taken out and removed only in sections. Its dimensions were nearly as given for the other.

In addition, four teeth were secured. Two were almost worn away, and evidently would soon have been lost. Two were full size, exposing from the socket nine inches of masticating surface, six inches being imbedded in the jaw. The whole length of the tooth was fifteen inches, and the depth eight inches. The bones of the skeleton were so far decayed that they could not be preserved.

This animal was the *Elephas Americanus*, long since extinct. Other remains of this elephant have been found in this locality. In the work of removing the specimens, valuable aid was rendered by Prof. Hay, of Crawford county, then visiting in Manhattan, and by several of our students, members of the Scientific Club.—Prof. Fairlyer.

Drawing in Our Public Schools.

How much time should be devoted to drawing in our public schools? Industrial drawing is taught in the public schools for several purposes. If these consisted merely in the necessary improvement of industrial manufactures, by creating artisans and an appreciative public, it would be just to reduce the time given to this study in agricultural Kansas, as compared with manufacturing Massachusetts. The main purpose is, however, the grand educational influence resulting from a development and training of the pupil. Even if no use whatever was made of drawing as an art by half of those who learn to draw, the intelligence, sensi-

tiveness, and accuracy which drawing alone creates, are needed by every human being every day of his life. Walter Smith says: "Ability to draw is, perhaps, the least valuable of the results which the teaching of drawing leaves behind; for, if nothing more were acquired than the proper use of the senses of sight and touch, every child would be repaid by such an acquisition for the time spent in attaining it. We are all victims to the delusions of eyesight, until we are taught to see; and a man's account of what he sees is apt to be very superficial, or strongly distorted, unless he can deduce the fact from appearance, which he can never do until he has produced the appearance from the fact; and that is only possible by drawing." And in this, all great educators, from Pestalozzi to Mann, agree.

For this reason, there is nothing very wrong in looking to other countries for an answer to our question, even if some of them should be more largely interested in manufacturing. At a recent distribution of prizes to the students of the Ecole des Beaux Arts, at Paris, the art director of France urged the value of art education in the public schools; and announced that it had been concluded by the authorities to devote not less than two hours per week to drawing in the primary schools, and at least three hours in all higher schools. The Belgian government, for the same purpose, has taken from two to three hours in its communal schools. In Switzerland, that is, in the outer cantons, having perhaps the best system of elementary education in the world, from two to three hours per week are devoted to drawing. Germany is increasing the time allotted to drawing to two and three hours per week. In the Cincinnati schools, the earlier grades of the district schools have three lessons of thirty minutes each, and the later ninety minutes; while the high schools have forty minutes each week.

Walter Smith thinks two hours, divided into lessons of thirty minutes each, the least time that should be given to weekly drawing exercises in primary schools. In Massachusetts, where he has been officiating as Art Director of the Public Schools for the last ten years, this time has been granted by the educational department of the State.

There seems to be no doubt, then, among those who have made the subject a life-study, that no less than two hours a week, throughout the whole course, should be given to drawing. If, from any cause, it should be impossible to teach it thus, then the primary classes should be selected as the ones where greatest good could be obtained by its introduction. There it would have the most general and greatest influence upon the pupils and the public.—Prof. Walters.

An Experiment for Kansas Farmers.

There is, all over the State, a pressing need of facts relating to the commonest practices on the farm. The settler of every new State is, from the nature of his surroundings, more or less an experimenter: he brings to his new home the methods and machinery of the old; and these, one by one, are discarded, or their value confirmed, with his increasing experience. It is doubtless owing to this fact—that the settler must be a learner—that the expression has become common in all parts of the State, that "he who knows least of Eastern methods, is the most likely to succeed in Kansas." He is the most likely to succeed because he has fewer prejudices to combat, and less to unlearn every way. But facts thus wrought out are necessarily limited in number and in scope. As soon as the farmer finds that a particular kind of grain or method of planting is reasonably successful, he rests content;

and whatever further facts he discovers are generally the result of accident rather than design. Hence, we find in every new country, that the varieties of grain cultivated, the methods of culture, and breeds of domestic animals, are few in the extreme, and out of all proportion to the wants of the people or the varieties in soil and climate existing. There is, for this reason, in Kansas as in every new country, a wide field for observation and experiment. But what is wanted, is not merely facts wrought out in Kansas, but rather the result of experiments carried on in every section of the State. The results of experiments made on the Agricultural College farm, for example, may be directly applicable over a large section, and they may be suggestive to every farmer in the State; but, necessarily, many of these must be verified by direct experiments, made under various circumstances of soil and climate, before they can be generally applied in all sections of the State.

It is for this reason, and because the question of the tame grasses is just now pressing upon the attention of Kansas farmers, that we venture to suggest an experiment in the cultivation of tame grasses that is within the means of every farmer in the State. Let every farmer reading this article, who resides in a section of the State where the cultivation of the tame grasses may be considered at least an open question, make preparation at once to apply the test upon his own farm the coming season. For this purpose, select now one acre of land, the richer and freer from weeds, the better, but be certain that the ground has been cultivated at least two or three years; and, if you doubt its fertility, give it a good coat of well-rotted, farm-yard manure. In the growth of the tame grasses, it is hardly possible to overdo in the matter of enriching the land. If one acre seems too much, try a half-acre of ground; but we do not advise the use of more than three or four acres by any one without experience in the cultivation of tame grasses in Kansas. Late in winter or early in spring, secure orchard-grass seed, at the rate of 1½ bushels to each acre of ground employed. We advise the use of orchard-grass in this experiment, because our experience has shown that, for withstanding drouth, and in the amount and value of the feed it furnishes, orchard-grass has no superior certainly, if it has an equal, among all the commonly grown grasses. Good seed may be had at most country stores; but generally it will be safest and cheapest to send directly to some large wholesale house at St. Louis or Chicago. But wherever the seed is obtained, as soon as it is received, count out fifty seeds and plant these in a pan of earth, which place in some warm situation, and then notice how many of these seeds develop into healthy plants. In this way, the value of the seed can be easily ascertained beforehand, and the disappointment growing out of the use of worthless seed, easily avoided.

In the spring, let this acre of ground be thoroughly prepared, by plowing and harrowing; and, as soon as the spring rains have set in, sow the seed broadcast, following with a light harrow, and, if possible, the roller. From this time forward, beyond mowing down the weeds when too luxuriant, no further attention need be given the experiment. If, after the fall frosts have destroyed the weeds, there appears only a thin sprinkling of grass plants, no alarm need be felt: a single plant upon each square nine inches or foot is sufficient to develop a strong stand of grass the following season.

This is an experiment within the reach of every one of our farmers; but, if we could induce no more than two or three persons in each county to try the "tame grasses" on this limited scale, we are confident that the experiment would prove of incalculable value to the agriculture of the State. In conclusion, the writer holds himself in readiness, by correspondence or otherwise, to assist any one who may wish it in carrying out the suggestion of this article.—Prof. Shelton.

Educational Gossip.

The brick-work of the new school building at Marysville, is nearly completed.

Wichita College opened on Monday, the 4th of October, at the frame school-house in the first ward, with a good attendance.

And now comes Wirt Walton and says that C. J. Brown, of Marshall county, is the father of the county normal institute.

The high school of Topeka gave a well-attended concert at the Tabernacle, last Thursday evening, to raise money for a new organ.

Vol. 1, No. 5, of the *Educational Review*, organ of the Fort Scott Normal School, has come to hand,—bright and interesting as usual.

The school board of North Topeka was compelled, at their last meeting, for want of room, to exclude all children under seven years old.

The new school edifice in course of construction in Fredonia, will cost upwards of ten thousand dollars, and will be one of the finest in southern Kansas.

The Marysville *News* says that Marshall county has 2,948 male, and only 1,822 female, children of school age. How is that, brother Tom? Did your typos blunder in setting those figures, or is the statement a fact?

Mr. Eskridge says, in a letter to the *Emporia Journal*: "The State should make an appropriation to cancel the \$20,000 of normal-school bonds, which the last legislature forced upon this city and county." Lawrence has some \$100,000 in the same shape, and Manhattan between \$10,000 and \$20,000. Other towns to hear from.

The Presbyterian Synod, in session at this city, elected the following trustees of Highland University, for three years: Dr. Lewis, of White Cloud; H. Walker, of Beloit; Judge J. C. Clark, of Topeka; John L. Freeland, of Blue Rapids; Rev. Samuel M. Osmend, of Lawrence; Rev. John A. Pinkerton, of Beloit; Rev. James A. Griffin, of Irving; Rev. D. R. Todd, of Netawaka, Kan.; and Judge B. Cowan, of Oregon, Mo.—*Atchison Patriot*.

Prof. D. J. Evans, of Great Bend, was tendered, by Gen. Walker, Superintendent of the United States Census, a position in the Washington office. He is to have supervision of, and assist in the work of, compilation. The compensation will be very liberal. He has accepted, and is appointed. The Superintendent writes that this appointment is tendered because of the efficiency and thoroughness shown by him in the discharge of his duties as Supervisor of the Census.

The following resolution was passed at the closing meeting of the Phillips County Teachers' Institute, October 4th: "We recognize Miss Ida A. Ahlborn to be a true leader of the teacher's profession,—one who has made teaching a study, and who is an honor to her calling,—one whose untiring efforts has placed her at the head of a profession that is second to none; and that she is entitled to our best wishes and many thanks for the interest she has manifested in our improvement."

Miss Sarah Brown has formally accepted the nomination for State Superintendent, on the Democratic ticket. Speaking of this nomination, the *New York Sun* says of Miss Brown: "She is remarkably well educated, takes a deep interest in schools, and is abundantly competent to discharge the duties of the office for which she is nominated. We believe she is the first woman who has been run for a State office by either of the two great parties." Again, the *Lawrence Journal* says: "As superintendent of this county, she has shown that educational matters are emphatically the province of women. Under no previous officer has so much been accomplished."

THE INDUSTRIALIST.

SATURDAY, OCTOBER 16, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

On next Friday, the public exercises will consist of declamations by a division of the third-year students.

Mr. D. A. Beckwith, the energetic editor of the *Kansas Homestead*, gave us the pleasure of a call on Thursday.

Mr. L. B. Rogers, whilom student of this College, and now a limb of the law at Solomon City, was at the College Wednesday and Thursday, having business with the Board of Regents.

The next meeting of the Central Kansas Breeders' Association, will be held in Prof. Shelton's lecture-room, on Thursday, Nov. 4th. A full attendance is desired at this the first meeting of the season.

The Horticultural Department is in receipt of a valuable addition to the herbarium, a gift of the U. S. Department of Agriculture. The donation includes 360 species of plants from Europe, and from the Eastern and Southern United States; and most of them are of kinds heretofore without representation in our herbarium.

No one should be deterred, by its length, from reading the article on our first page, headed, "Financial Education," which we clip from the *New York Nation*. Whether you are a "black Republican," "greenback lunatic," or "mossback Democrat," this article should prove suggestive; and, if you are a teacher, or member of a school board, you ought to be able to evolve a practical idea therefrom.

Prof. Failyer's *Elephas Americanus* need occasion no alarm. Was it Artemus Ward who so profoundly said, "There's nothing in a name"? a sentiment with which we accord most sweetly. Besides, the gentleman is dead. He died several million years ago; and, if the intelligent compositor should make a mistake of two or three ciphers in setting up this long number, beyond the possibility of damaging so much type, no injury can result.

The present week has been bare of incident, and monotonous in the extreme. No elephant or other new breed of cattle, which has "perished while vainly trying to climb the steep bank of the lake," has been discovered; and the Domestic Science Club has failed to send us its usually very interesting report. It is true the October elections and a Board meeting have been held; but these matters are too trivial to occasion a flutter in the bosom of your "city editor," who feels that just now there is very little worth living for.

The "cold snap" is here; and while it destroys the azaleas, fuchsias, trailing arbutus, and sweet-scented ampelopes which, with chunks of coal and limestone spalls, bloom in sweet profusion beneath the INDUSTRIALIST's windows, we are more than consoled by the thought that it also kills the sappy watermelon; and that for ten whole months our exchanges will have absolutely nothing to say about that "delicious watermelon," "the finest we ever ate," presented by an admiring subscriber who is "the best farmer in his section of the State."

On Saturday evening, October 9th, the Webster Society met at the usual hour. Although the rain has succeeded in stopping us but once, the dust made an attempt last Saturday evening, and utterly failed to stay the "despondent" Websters. We had a good time. Messrs. G. L. Horning, H. J. Horning, M. H. Markum and Charles F. Bailey were initiated. Decision of the debate was rendered in favor of the negative. Extemporaneous speaking was decidedly interesting; and we

were glad to see so many visitors take part in this exercise. They certainly should become members of one of the societies. We were glad, also, to meet our friend, A. Beacham, B. S., in the Webster Hall. The *Reporter*, by Mr. Houston, was quite interesting. Mr. Markum will present the next paper. Next Saturday evening, W. H. Meek will declaim, E. V. Cripps will present a composition, and F. A. Hutto will read a selection. Our committee reported that the pictures for decorating the Society Hall will soon be here. The Society acknowledges the receipt of a Smithsonian Report for 1878. It was decided to have an extemporaneous debate next evening. In extending an invitation to new students to visit us, we would suggest that some of our brethren "brace up."

CÆSAR.

Some excellent counsel was given in chapel, a few mornings since, by President Fairchild, to those young men who undertake to meet fortune half way by bucking against the tiger through the "wheel of fortune," lotteries, and other gambling appliances. After referring to the moral aspects of the question, and the folly of staking money on a game whose manipulators always held a large majority of the chances, he said, speaking of lotteries: "If you should purchase all the tickets, and thereby secure all the prizes, you would still be an enormous loser. The persons who take the fewest chances make the most, or rather are the least likely to be losers."

Notwithstanding the threatening storm on Friday afternoon, a large number of the enthusiastic Alpha Betas met, expecting, of course, an interesting session. After the usual opening exercises, we passed immediately to miscellaneous business, and gave an invitation to our brother Society, the Webster, to unite with us in a joint session and social gathering, to be held at a time set by them. The following committee was appointed to confer with the Websters and, jointly with a committee from that Society, arrange a programme: F. M. Jeffery, John Copley and Grace Parker. Messrs. Ward and Wyland and Miss O'Meara were initiated. Extemporaneous speaking was participated in by all. Much interest was manifested concerning late elections in Ohio and Indiana. In a declamation by Henry Cottrell, we were shown some of the troubles foreigners have in conquering the English language. Miss Hunt read a selection. The question in debate, upon the relative advantages of city and country as a situation for an institution of learning, was decided in favor of the city. The names of eight persons were proposed for membership. Next week the *Gleaner* will be presented by B. L. Short and Grace R. Strong. Debate upon woman's rights will be led by F. M. Jeffery and Flora Donaldson. We were twice during the session favored with fine musical selections. Come next week and hear our Short, Strong paper, and a thorough discussion of woman's rights.

A. B. QUILL.

PROCEEDINGS OF THE BOARD.

The Board of Regents were in session this week from Tuesday evening to Thursday evening, Regent Challiss being absent.

The quarterly report of the Land Agent was presented and accepted. Several cases of delinquency among contractors for land were considered; and the agent was ordered to notify all delinquents that immediate settlement must be effected.

The Secretary was ordered to advertise for sealed proposals to furnish fuel for College use.

Members of the Faculty presented, by invitation, the general condition and needs of the several departments. By resolution of the Board, the first evening session of each quarterly meeting hereafter is devoted to a presentation of such reports by the members of the Faculty.

The bills of the last quarter were audited; and expenditures were authorized for current necessities and the following improvements: small propagating pit (\$50.00); model and implement case for drawing-room; frost-tight cellar for laboratory; work-closet for botanical room; closets and partition for rooms in Society Hall; curtains for the printing-office; table, chairs and pamphlet cases for the President's office; jar for alcoholic specimens in museum; and stock for the nursery.

Various details of management of lands and school bonds occupied the attention of the Board; and much of the time was spent in consideration of the biennial report of the Board to the Governor, which the Secretary was authorized to perfect and transmit.

The Board adjourned to meet on the evening of Wednesday, January 5th, 1881, at which time a semi-annual auditing of accounts of the various officers is expected.

Classes for drill in composition and elocution met yesterday for the first time this term. Surely time given to exercise in good reading and declamation will well repay the investment.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for

absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlington with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. WM. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.
WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome. WARREN KNAUS, President.

GEO. F. THOMPSON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations. I. D. GRAHAM, President.
G. H. FAILYER, Secretary.

Long & Firestone, Livery, Feed and Sale
Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry. Photography and Household Chemistry.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange are issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 16, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.
Stems: Their derivation; their offices and properties; their relation to other parts of words.
Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.
Compounds: Their value; their properties and uses; the laws governing their formation.
Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.
Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE.

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE.

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.



THE INDUSTRIALIST



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Address A. A. STEWART, Manhattan, Kas.

AGRICULTURAL COLLEGE.

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MRS. M. E. CRIPPS, Sup't Sewing Department.
W. L. HOFER, Teacher of Instrumental Music.

THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

A Club for Study.

The benefits which cultivated women render to science, are illustrated by a club of ladies in Syracuse, organized for botanical study in the woods and fields. Although less than a year old, the club has made discoveries which have attracted attention from the leading botanical authorities in the country. An orchid, the *epipactis*, new in America, was found by one of the ladies, during the weekly visit of the club to the woods. A still more important achievement was the finding of a fern which had been lost sight of for three-quarters of a century. This is the *Scelopendrium officinarum*, first found in North America by Dursh, an English botanist, in 1804. He found it near Onondaga; and many botanists have searched for it since in vain. There are but two other localities in the United States where it is known. Several other rare plants have been discovered by the club. Professor Gray wrote the ladies a letter of congratulation upon hearing of the discovery of the *epipactis*, telling them that it was never before found in America. How much more sensible is this manner of employing their time and energy, than the waste of it in frivolous reading, rapid social calls for mere etiquette, or the mechanical fancy work, without artistic skill, in which so many ladies pass their leisure hours. Botany is eminently suitable for the pursuit of women; but there is no branch of science which they cannot profitably study, while their patience and perseverance will enable them to excel in research. So vast and pressing are the interests and incidents which daily demand our attention, that the excellent work which women in all parts of the world are doing in science, comes to the notice of but few persons. It is not work which brings riches, nor great fame; but it is of the utmost value. Miss Ormerod lately read a paper before the English Entomological Society, entitled, "Sugar-cane borers of British Guiana," and exhibited specimens of the insects in different stages of development. The exhibition was made in behalf of the colonial company, who were anxious to learn any practical method of dealing with these insects. The contributions to our knowledge of insect-eating plants, by Mrs. Mary Treat, of Vineland, are widely known. A record of her studies of the habits of the slave-making ants, and the harvesting ants of Florida, is published in the Half-Hour series, and is as interesting as a fairy tale. If mothers would familiarize themselves with the facts of the world of nature, in the midst of whose wonders they live and move, they would find their knowledge invaluable in the amusement and education of their children, and especially in developing in them rational and fervent religious feeling and principle. —Elizabeth Churchill, in *Woman's Journal*.

Drive Wells.

The following interesting information on the "drive-well" question, comes from Des Moines, Iowa, within a few days: There are over three hundred drive-well cases on file in the Federal Courts here, which have been on the docket over a year. It is expected that they will come to a final trial at the next term. It may be of interest to thousands of well-owners in Illinois, as in Iowa, to know the status of these cases, and the probable outcome. The cases may be briefly stated thus, as has been developed and shown by the records: In September or October, 1861, N. W. Green, at Cortland, N. Y., suggested to several persons that he believed a well could be made by driving a pointed iron tube with holes in the side, for water to pass through, into the earth, to which a pump could be attached to raise the water. He got Bryan Mudge, J. C. Carmichael, and one Robinson, to make the

experiment; and, after five trials, they succeeded, in the latter part of October of that year. The Seventy-sixth New York Regiment was then in camp at that place. Green was its Colonel, and Julius A. Graham sutler. At the suggestion of Green, Graham hired Mudge to put a well in the mess-house, which was paid for by Graham, and used while the regiment remained there. Subsequently Mudge and Hiram Suggett put in several wells in Cortland, in 1862-3-4-5. In March, 1866, Mr. Green applied for a patent, which he received in 1868. In 1871 he surrendered that patent and got a re-issued patent; and it is on this patent that all these drive-well suits are brought.

It is shown by abundant testimony that wells embodying all the principles claimed were made and in use in Cortland in 1858; and that in Warsaw, in 1858, was one exactly like Green's, and which was used one year, as sworn to by five witnesses. By over thirty witnesses it is proven that a drive well like Green's was in use in Independence, Ia., in 1861. Fifteen witnesses swear to the existence of a drive well at Hunt's, in Livingston county, New York, in 1850. Several witnesses swear that two wells were in use in Saratoga county, New York, in 1860, and in Rensselaer county, New York, in 1858.

The record shows that, by stipulation of the attorneys, the complainants were to close their testimony July 1st, last; that they then asked and obtained until Aug. 15; that on the 12th of August they obtained thirty days' more time, which expired last Saturday. Unless they get more time, the cases will be tried in October. It looks very much as though they were seeking this delay solely for the purpose of pushing their claims for royalty. —Grange Bulletin.

Over-Exertion.

Long-continued exertion, without proper intervals of rest, is followed by a peculiar sensation of fatigue, and often by tremor or cramp. Fatigue is due, in part, to the failure of contractile material and an accumulation of waste products in the muscles, but, in the main, to exhaustion of the nerve centres that supply stimulus to contraction. Both tremor and cramp are probably caused by excessive muscular irritability; the former being due to short, irregular explosions of muscular force, the latter being a prolonged contraction of the muscle.

When over-exertion is confined to a small group of muscles, these, instead of becoming enlarged and strengthened, as is the case when exertion and rest are duly interchanged, suffer chronic exhaustion, which shows itself in a species of paralysis; as, in the palsy, or cramp, severally peculiar to writers, telegraphers, type-setters, violinists, pianists, tailors, milkers, and men of various trades whose work is mainly with the hammer. —Exchange.

The English Sparrow.

We have always felt a great fondness for animals, — especially birds, which we could never feel reconciled to see shot upon our premises. We were among those, years ago, to praise the English sparrow, and to advocate its protection; but we now warn farmers against this bird as a formidable enemy, — more formidable than the insects he is supposed to kill, by his staunchest friends. We have already remarked upon the serious damage which our wheat fields sustained by its ravages; and we have now to speak of the injury it has done to corn. It is found, upon a careful examination of our fields, that as many as one ear in every three has been damaged, — sometimes only at the very tip, sometimes as far as six inches down the ear, or as far as the sparrow could separate the husk so as to eat the kernel.

Those farmers who are benevolent enough

to share their crops to this extent with this unruly, greedy bird, may do so, of course; though it is hard to tell how severely their benevolence may be tested in a few years, so rapidly does the sparrow increase in numbers. But we think such kindness might more wisely be extended to many of our native song-birds, which seem to have been driven away to the fields or woods or to other parts where the sparrow's yelp is not yet heard. —Rural New-Yorker.

Our Exchanges.

The bones of a man were found in the woods near Mulvane, Monday. A bottle of whiskey and a half a bottle of laudanum near them. —Winfield Courier.

Nearly 25,000 head of sheep are held in the vicinity of Spearville. On Sunday we noticed a band of 27,000 head of fine sheep, belonging to Mr. Whitman, being driven to that range. —Dodge City Times.

Illinois rejoices over her great wheat crop, — the largest by far the State has ever grown. She will have millions of bushels for exportation. As much, however, can not be said for the corn crop. —Grange Bulletin.

W. F. Chalfant, of the *Ledger* printing house and book bindery, has got out a new family edition of his *Nursery Melodies*, bound in white linen, which is said to be very nice. Chalfant thinks she's a pretty specimen. —Emporia Journal.

Another way to keep whisky and beer from our fair grounds, has been put in practice in Doniphan county, Kansas. The ladies resolved that the booths on the grounds should not be let for such purposes, and so made up a purse and outbid the saloon-keepers. —Grange Bulletin.

Mr. Joseph F. Cannon is happy in being the possessor of the 160-acre tract lying east of the Kirkpatrick farm, just north of Rossville. Bought it last week of Sedgwick's land office; and will open it up next spring by breaking it out, and starting with an orchard of between two and three thousand trees. —Rossville Times.

It has been decided long ago that Kansas should have a State fair next year, and the initiatory step in that direction has already been taken. A meeting was held at the fair grounds last Friday, which resulted in organizing temporarily, passing the necessary resolutions, and adjourning to meet again next Saturday at the court-house, in this city. —Topeka State Journal.

Corporations have no souls; but when they do a good act, they should have due credit therefor. During the past few months the K. P. R. R. has purchased 60,000 bushels of wheat, a large portion of this county, and distributed among the farmers on the frontier, taking notes payable "after harvest" for the same. Russell county received 23,000 bushels; Ellis, 21,000; Trego, 9,000; Gore, 4,000; and Graham and Sheridan, 4,000. —Abilene Chronicle.

Conductor Dean, in charge of a cattle train on the K. C. L. & S. Railroad, was killed yesterday near Elk Falls, in a peculiar manner. Some of the cattle had got down, and Mr. Dean was assisting the stockmen to roust them up while the train was in motion. He was holding on the outside of the car and stirring up the stock with a goad: while in this position he struck against an iron bridge, over which the cars were passing. He was thrown from the cars and partially under the train, and one arm nearly severed from the body, which then fell through between the ties into the bed of the creek. We have no special details; and whether he was killed by striking the bridge, by the cars running over him, or by the fall to the ground below, we are not able to state. —Covley County Telegram.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 23, 1880.

H. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE annual meeting of the Kansas Academy of Science will be held at Topeka, on the 11th and 12th prox. The College will be represented at the meeting by President Fairchild, Profs. Failyer and Popenoe, and several students. President Fairchild will deliver one of the two popular evening lectures; the other being given by Prof. Lovewell, of Washburn College. The present indications are for a session of unusual interest.

A CURIOUS instance of abnormal growth is to be seen on the grounds of Dr. Roberts, of Manhattan. A cherry tree of the Early Richmond variety, about five years old, lost its foliage entirely in early August, and seemed dead. The rains soon after caused a second growth of leaves to appear, and with them a crop of blossoms. The peculiarity of the occurrence rests in the unusual character of these blossoms. In nearly all, the calyx-lobes were broadly expanded, like small leaves, several times larger than lobes of the ordinary size. Some of the blossoms fruited; and the calyx, instead of dropping as the fruit enlarged, remained attached to the flower-stalk, retaining in its lobes the leaf-like form and color. Some of the buds, instead of producing flowers, expanded into short, leafy branches, with buds in the axils of the leaves, and with a rosette of leaves at the tip, very evidently a flower arrested in development. Still others are intermediate between this and the form described above. One pedicel has a pair of small leaves along the middle, and the usual floral organs at the tip; another is to all appearance a cherry stem, but bears an irregular rosette of leaves instead of a fruit; and other specimens show equally interesting blendings of the characters of the branch and the flower.

Notes on Some Ornamentals.

A few young trees and shrubs were received at the College, three years since, from the Cambridge Botanic Gardens, and were planted in the experimental grounds of the Horticultural Department. Some of these trees have so far done so well that their case merits the attention of those planting ornamentals. Among those that have made a strong and hardy growth, the Siberian cork tree (*Phellodendron amurense*) is prominent. These trees have grown rapidly, and are becoming handsome specimens. Last winter it was thought the tips of the branches had been injured; but there now appears no evidence of injury. Another fine tree of rapid growth, and entirely hardy up to the present, is the Liriodendron, or tulip poplar. A specimen of the European white birch has each season made a good growth; but last winter killed back the branches of the season for several inches from their tips. A half-dozen small trees of the black birch, growing in the same situation, have rapidly increased in size, and have stood the diversity of our seasons without any appearance of injury. The same may be said of the shingle or laurel oak, of which there are several fine specimens. Several young trees of the balm of gilead poplar, have grown about as much as the native cottonwoods do under the same circumstances. Some plants of Cassena holly (*Ilex cassena*), received and planted last spring, have made a growth of over three feet since planting, in spite of the very unfavorable summer. Thrifty repre-

sentatives of the pecan, Spanish oak, common persimmon, hop-tree (*Ptelea trifoliata*), high-bush cranberry, cock-spur thorn, and three other species of *Crataegus*, are also growing vigorous and hardy, in these rows. Among the more promising shrubs may be mentioned the *Forsythia suspensa*, the wild black currant (*Ribes floridum*), *Spiraea Thunbergii*, and the prickly *Aralia* (*A. spinosa*). Some others,—the *Rubus spectabilis*, the spice bush (*Benzoin*), a native *Hydrangea*, the sycamore maple, and the chestnut,—have made but a poor stand against the drought and heat of our summers. If transplanted to a more protected situation, these will probably soon assume a more favorable growth.

In the old shrubbery rows, in the lower gardens, several kinds of shrubs have stood the varying fortunes of seven or eight years past, annually presenting their abundance of bloom. Among them, the thriftiest are the bridal-wreath *spiraea*, the elm-leaved, Billard's, Reeves', and Fortune's *spiraea*s, the golden-leaved ninebark, Fortune's *Forsythia*, the deep green *Forsythia*, the purple and common barberries, the scarlet Japan quince, Kalm's *Hypericum*, snowball, two species of *Philadelphus*, the white and the rose-flowered Tartarian honeysuckles, the black-fruited *Pyrus arbutifolia*, and several varieties of *Altheas*. From this list, one of moderate desires might select flowering shrubs that would furnish a succession of bloom through the entire growing season,—from the *Forsythias*, that bloom almost too early, the buds being frequently killed by frost, to the *Altheas*, that bloom in September. In addition to its other beauties, the *Pyrus arbutifolia* is covered in autumn and winter with its glossy black fruits, that render the bush handsome, even at this season of the year.—Prof. Popenoe.

The New Rugby.

What teacher has not read those two wholesome books,—Tom Brown at Rugby, and Tom Brown at Oxford,—which give such a clear insight into the character of our English cousins, who does not remember the portrait of that grand teacher, Arnold of Rugby, drawn by his loving pupil? The author of those books, Mr. Thomas Hughes, has long been known and admired by American readers; and they will be glad to learn that he is about to make his home in this country. He is the leader of a colonizing scheme which, in its aims and prospects, is one of the most important that has ever been tried.

The location of the colony is in northern Tennessee. Forty thousand acres of land have already been secured; and it is proposed to increase this area to 400,000 acres, as the needs of the colony may demand. The new town, to which the name of Rugby has been given, was formally named and dedicated Oct. 5th, on which occasion Mr. Hughes gave an address replete with sound, practical sense. The distinguishing feature of this colonizing scheme is co-operation, not communism, which has often been tried and failed. The system of co-operation which has proved so eminently successful in Rochdale, a manufacturing town in England, is to be tried in developing a town and improving farms on the Cumberland plateau in Tennessee.

Under the guidance of this manly leader, with the help of such men as he will naturally attract around him, we may hope that the new Rugby may become as celebrated for working out some of the problems of social and political science, as the old Rugby for its classical school. Success to the sturdy Briton and his new Rugby.—Prof. Ward.

The Distribution of Profits.

The terms co-operation and co-operative have come to have a technical meaning. We have "co-operative agencies," "co-operative stores," and a few "co-operative manufacturing establishments." The things which these terms represent are of recent origin; and hence the terms themselves are not generally understood. Persons of small means unite their capital and often their labor in business, and share in the profits. In our country, this principle of co-operation is principally confined to mercantile business. In many of the towns of Kansas, there are co-operative stores; and their success suggests the practicability of still further recognizing this principle in the business world. The principle of co-operation, briefly stated, is this: The profits in business shall not be monopolized, but shall be distributed among all who are engaged in the business. Let this principle be once recognized in society, and the present antagonism between labor and capital would cease.

Labor and capital are both required to carry on any extensive enterprise. Alone, each is helpless; but, united, what cannot be accomplished. Both alike look for immediate returns: labor expects wages, and capital demands interest. The price of wages, the rate of interest, are both subject to an inexorable law,—the law of supply and demand: this, neither can escape. But business enterprises requiring the union of capital and labor, are carried on for something else besides the usual interest and mere wages. Profits are expected. Now, what may be considered the net profits of a business? What remains after capital has secured its interest, after labor has received its wages, after government has been paid for its protection, after the control or superintendency of the business has been fully compensated,—after all of these have been deducted from the proceeds of the business, there is often a surplus,—this is the net profits. Now, to whom does this surplus belong? Can any one party, in justice, claim it all? The tax which the government claims for protection has been paid: it asks no more,—it claims no part of the profits. Can the superintendent, the man who has so successfully united labor and capital in the production of wealth, that the capitalist has received his interest, the laborer his daily wages, the government its tax,—can he claim these profits as his exclusively? He has already received, in his generous salary, the compensation due to his superior skill and intelligence. Can the laborer claim the profits by urging this plea, "If it were not for my toil, this wealth would not have been created. Capital of itself is inert, as it cannot produce wealth. The profits belong to me." Would not the capitalist retort by inquiring: "Who called this business into existence? Who subsisted yourself and family while these profits were accumulating? I have paid you current wages. I have paid the taxes imposed by the government. I have borne the risk of fire and flood, and I demand the profits. I admit that I have already received interest upon my capital invested, per cent per cent; but in the natural order of business the profits are in my hands, and I will retain them." And he does retain them, and makes them as large as possible. The laborer feels that he is wronged. He is wronged: he is entitled to a share in the profits, because he helped to produce them. Profits, or the increase of wealth in any country, is the result of the co-operation of labor and capital; and each is entitled to a share. This is co-operation. Let this true principle be once universally recognized in business, and antagonism between the laborer and the capitalist would be unknown.—Prof. Ward.

Educational Gossip.

Hays City is practicing Pinafore. Hanover, Washington county, has a Catholic school.

Victor Hugo has lately celebrated his seventy-eighth birthday.

The Atchison Institute has 160 students. Twenty-four of the number are in the Kindergarten department.

The pupils of the Peabody high school are contemplating giving a festival, for the purpose of securing an organ for the use of the school.

In the course of study adopted by the board of education of Osage City, we read, "Drawing,—for recreation and change of occupation." Did you do that, Williamson?

A young lady teacher of McPherson county has written a poetical history of the United States. We should like to see the stanzas singing of bachelor President Buchanan.

A new literary paper, *The Whim Wham*, has been started at Topeka. There is no lack of Whim about the capital papers; therefore, bring chiefly Whams, and ye shall live. Whams, Whams, that's what they are often lacking.

The Shawnee County Teachers' Association has been resurrected and reformed again. The next meeting will be held at Lincoln Hall, on Saturday, October 30th, at 1:30 p. m. The meetings of the Association have been very spirited and profitable during the past year; and we predict a "ditto" for this winter.

The McPherson county *School Journal* has reached our reading-table. It is published monthly by Mrs. Mattie Murphy, county superintendent; and is devoted to the interests of teachers, pupils, parents, and school officers of the county. Twenty-five cents will buy it a year.

Mrs. Lucy Taylor has practiced dentistry in Lawrence, Kansas, for twenty years; and has enjoyed a good pay. She was the first woman graduate in her profession in this country. After her marriage in Chicago, she taught her husband her profession; but has always been the head of the firm herself.

The "school-marks" of Newton are in a rather sorry plight just at present. On account of the shortage of finance in the treasury department, they will be unable to draw any of their salary until after the first of December. Consequently, the visions of new dresses they had indulged in, will have to go by the board for a while, according to the *Kansan*.

The State School Fund Commissioners have exchanged \$8,000 of school-district bonds No. 1, Ellsworth county, for the same amount of re-funding bonds, same district, bearing interest at 6 per cent, being a reduction of 4 per cent per annum. Any one can see at a glance that this is an evidence of financial wisdom on the part of the State Board; the State only losing 4 per cent per annum by the transaction, and the school gaining the same.

A case of considerable interest to school districts was decided at the term of the Riley county District Court, just closed. The court held that school boards have no authority to purchase lightning rods without a vote of the district at an annual or special meeting, authorizing the purchase of the same. In this case, the school board had purchased a lightning rod without authority of the district at its annual or special meeting, and given an order therefor, and suit was brought by the bearer to recover upon the order; but the court held that the order was unauthorized, and that the party could not recover.

County Superintendent Boyakin, of Marshall county, closes his annual report with the following remarks: "The fall schools are opening under promising auspices. 'There is,' says Congressman Anderson, 'as much human nature in Kansas as the square acre as anywhere else in the world.' And certainly in no field of our general socialism does this same human nature crop out with more sharp points, than in school matters. Yet there is almost a perfect agreement among the people on school issues. Very little cross-pulling among boards or teachers. There is but one sentiment in the county on our common-school system. That is in favor of it. We would not welcome an immigrant into our county who was not in favor of the broadest possible education,—rich and poor, black and white, Jew and Gentile."

THE INDUSTRIALIST.

SATURDAY, OCTOBER 23, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, Committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Revs. Wake, Lockwood, Caruthers, and one or two other gentlemen connected with the Conference of the Methodist Episcopal Church, visited the College on Wednesday.

Mr. C. A. Dow, an old student of this Institution, and now a thriving farmer and County Surveyor of Coffey county, was shaking hands with his many friends on the Hill yesterday.

In addition to the large live-stock transactions mentioned in another place, the College Farm has this week sold 15 stock hogs at \$4 per cwt. Although these pigs were the "culls" of their respective litters, they were all pure-breds, and sold readily for twenty-five cents per cwt. above the market price of common stock.

COAL AND WOOD WANTED!

The State Agricultural College will buy, this fall and winter, sixty tons of soft coal and fifty cords of seasoned hard wood. Sealed proposals to furnish either or both will be received up to November 5th. Bids for coal contract may state terms for delivery in one lot, and in car-load lots upon ten days' notice.

GEO. T. FAIRCHILD, President.

State Agricultural College, Oct. 21st, 1880.

We notice, on the door of the Mechanical Building, a "pen portrait" of a wretched-looking, insectivorous bird, with plumage in a sad state of disarrangement; from which we infer that the writing-master is abroad. Why is it, anyhow, that the youthful writing "professor" always takes for his subject a half-picked chicken? Does the partially defoliated bird indicate the near presence of the writing artist, as the striped pole does the barber, or the upturned boot the man of awls and wax?

The new propagating pit, that will stand us in place of a greenhouse at present, will be ready for use the coming week. This structure is on the south side of Horticultural Hall, east of the entrance. Its dimensions are 12x24, furnishing 235 square feet of bench room. It is heated by flues; and will be used for the protection of bedding plants through the winter, and for the propagation of early plants of all kinds in spring, when it will take the place of the hotbeds and frames that have heretofore been our only appliances for these purposes.

The building of the Methodist Church is an epoch in the history of Manhattan. Twelvemonths ago no one would have been so presumptuous as to assert that a good church could be built within a year by any society in Manhattan, and dedicated free of debt. But it has been done. The building is one of the chief ornaments of the town. In its internal arrangement and its external appearance, we know of no church of equal cost in the State that is superior to it.

Last Sunday morning came, and \$1,300 of the cost was unprovided for; but, under the encouraging leadership of Chaplain McCabe, those who before "lifted until they could see stars," nerved themselves for one more effort, and the thing was done. We congratulate our Methodist friends on their beautiful church home; and, as citizens of Manhattan, we are proud of their pluck and enterprise.

Society was called to order soon after the public exercises of the third-year class. Society room was filled with a goodly number of Alpha Betas and many visitors. All of the officers were present. Misses Pope, Hopper and McElroy, and Messrs. Donaldson, Platt and VanFossen, were initiated. A very interesting number of the *Gleaner* was presented by B. L. Short and Grace Strong.

Debate was postponed until next Friday, by the consent of the Society. The question under discussion is, no doubt, of great interest to us all; and it will be thoroughly discussed by the able debaters chosen, whose names were given in last week's report. Much of the time under the head of miscellaneous business was taken up in making arrangements for the joint session of the Alpha Beta and Webster Societies. The time, we believe, was not decided upon, as that was left to the other society. At the next meeting, we shall have the usual orders of declamation, essay and select reading. Visitors are always welcome. M. E. M.

A valuable addition to the College herd of Short-horns has recently been made by the purchase of the highly bred Short-horn cow, Wiley's Fidget, and heifer calf. The pedigree of the dam we give below:—

WILEY'S FIDGET.—Red, with little white; calved, Dec. 20th, 1872.

Got by Oxford Wiley, 8753.

1 dam, imported Fidget 6th.

by 4th Duke of Oxford, (11387).

2 dam, Fidget 5th.....by Delhi, (15865).

3 dam, Fidget 4th.....by 4th Duke of York, (10167).

4 dam, Fidget 2d,

by Duke of Northumberland, (1940).

5 dam, Fidget.....by 2d Earl of Darlington, (1945).

6 dam, Fletcher, by son of Young Wynyard, (3859).

7 dam, descended from J. Brown's Red Bull, (97).

Short-horn breeders will recognize in the above a practically "pure Bates" pedigree, and one of rare excellence. The College herd of Short-horns now includes four families; namely, Fidgets, Constances, Cambridges, and Young Marys.

SOCIETY HALL, Oct. 16th, 1880.

Webster Society called to order by President Knaus. After the opening exercises, the company proceeded to an extempore debate upon the question, "Resolved, That the United States should extend her dominion to the Arctic Ocean." Sides being chosen, spelling-school fashion, a large number of the audience took part. The judges, consisting of three lady visitors, after mature deliberation, decided the question in the affirmative. A declamation on "Half-way Doin's" was received with applause that threatened the safety of the house. Supposed speech of John Adams was rendered in an excellent manner, followed by an interesting essay on "Self-Reliance." Question chosen for next debate, "Resolved, That a man's character is exalted more by qualities of heart than of brain." The Reporter will be presented, and an interesting session may be expected. All are cordially invited.

SCRATCH-PAPER.

IMPORTANT STOCK SALE.

On Tuesday last, Mr. C. H. Shultice, a well-to-do farmer and stock-raiser of Ottawa county, succeeded in securing from the College herd the four magnificent Short-horn heifers whose names, and pedigrees in part, we give below:—

3d GRACE YOUNG OF COLLEGE FARM.—Red; calved, Nov. 4, 1876; got by Zenas King 15801; dam, Grace Young 5th, by Tycoon 7339, etc., etc.

GRACELLA.—Red; calved, Dec. 22, 1876; got by Zenas King 15801; dam, Grace Young of College Farm, by Minister 6363.

GEORGIANA.—Red; calved, July 30, 1878; got by 2d Duke of Jubilee 19498; dam, 1st Grace Young of College Farm, by Zenas King 15801.

GENTILITY.—Red; calved, Sept. 30, 1879; got by Delight's Duke 32131; dam, 4th Grace Young of College Farm, by Zenas King 15801.

By this purchase, Mr. Shultice has secured the nucleus of a valuable herd of Short-horns; and we are confident that the more he and his neighbors see of these animals, the better pleased they will be with the stock, and that they will develop into hardy, quick-feeding, stocky cows.

Mr. Shultice also purchased of the College a valuable Berkshire gilt, of our "Miss Smith" family; and, of Mr. C. E. Allen, a superior two-year-old bull, by the famous 20th Duke of Airdrie, out of a nicely bred "Young Mary" cow.

Mr. Shultice, and indeed the whole Solomon Valley, are to be congratulated in their good fortune in securing this valuable addition to the improved stock of their rich agricultural section.

We are confident that Mr. Shultice's investment of nearly \$1,000 will prove to him a source of constant pleasure, and great profit financially.

NATIONALIST ITEMS.

N. Ewing is now clerking for Blood, Brooks & Co. C. W. Brooks has gone to Buena Vista, Colorado, to be absent a year or so, and will have charge of the branch house of Blood, Brooks & Co.

W. Marlatt, Geo. S. Green and L. R. Elliott have been appointed a committee to prepare a history of the Methodist Church in this place.

Geo. W. Bain, the most eloquent temperance orator we ever heard, will address a union temperance meeting at the Presbyterian Church, Sunday night.

Miss Emma Hoyt is engaged as operator, with a good salary, at the city office at Junction City. There goes into the work of life a second graduate from our State Agricultural College.

The Western Union Telegraph Company has decided to open an office at the post-office. It will be in charge of Mrs. John A. Allen, who is an experienced operator, and will be prepared for business by the 1st of November. This will give us competition and the advantage of an up-town office.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urgently advised to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for

absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlington with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. Wm. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WARREN KNAUS, President.

GEO. F. THOMPSON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations. I. D. GRAHAM, President.

G. H. FAILYER, Secretary.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange is sued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 23, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry, Mineralogy.
	SPRING TERM.	Geometry. Entomology, Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.
Stems: Their derivation; their offices and properties; their relation to other parts of words.
Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.
Compounds: Their value; their properties and uses; the laws governing their formation.
Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.
Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, to make one a master of his mother-tongue, a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with a such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department. Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE,

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings, Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass, and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

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JNO. D. WALTERS, Teacher Industrial Drawing.
T. T. HAWKES, Sup't Mechanical Department.
A. A. STEWART, Sup't Printing Department.
I. D. GRAHAM, Sup't Telegraph Department.
MRS. M. E. CRIPPS, Sup't Sewing Department.
W. L. HOFER, Teacher of Instrumental Music.

THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Financial Education Again.

The managers of the "Ladies' Deposit Company," the Boston swindle of which we spoke a fortnight ago, have been lodged in jail; and the sheriff is in possession of such assets of the concern as can be found. The suffering caused by the bursting of the bubble is probably very great, but in most cases will be concealed. The "President" now weeps, and says there were a number of men behind her whom she does not know, and who paid her one hundred dollars a month for her management, and used to come every evening and carry off the day's deposits in a basket. That this story has some foundation is not unlikely. The affair has been very remarkable, for reasons we recently gave; but it has been made more remarkable still, within the past week, by a passionate defense of the "bank," from Gail Hamilton, addressed to the Boston Advertiser. This lady's contention is in substance that the swindle, if swindle it be (which she does not admit), is no worse than those which men, including managers of savings-banks, are every day perpetrating; and those who exposed it are responsible for the loss which has overtaken the depositors, inasmuch as it was owing to this exposure that the institution, for the first time, failed to meet the demands upon it. She, therefore, calls upon the editor to give his note of hand, with interest at eight per cent a month, for two hundred dollars, with which she had been entrusted by a poor southern woman, and which she invested in the "Ladies' Deposit." The letter reads a little like a burlesque, but is evidently seriously meant. It would form an interesting appendix to the series of letters against civil-service reform which Gail Hamilton published in the Tribune three or four years ago. But, bad as those were, they did not prepare one for this defense of Mrs. Howe's bank.

Colonel Higginson has apologized for the depositors in the bank on the ground of their ignorance of financial matters,—ignorance which is fostered both by the kind of education women receive, and by the way in which their male relatives treat them in all money matters. This is doubtless, in the great majority of cases, a sound plea; but it cannot be made to cover Gail Hamilton's. It is hardly possible that a woman who has for some years pursued political and social essay-writing as an occupation, and who has recently in a book advocated the abolition of the public higher education, can be ignorant that there is no honest banking which can pay ninety-six per cent per annum on deposits. It is consequently difficult to avoid the conclusion that she knew that the earlier depositors in Mrs. Howe's bank would be paid out of funds supplied by the later ones; and that when she invested her southern friend's money in it, it was with the hope of getting it out again, at the expense of other speculators, before the inevitable crash came. Undoubtedly plenty of male essayists and politicians are capable of making investments of this sort; but we have not yet heard of one who has had the audacity to come out in print in defense of such a speculation, and in denunciation of those who exposed it. Gail Hamilton's performance is important as touching the expectation of many, that the entrance of women into the political arena would exert a purifying influence on politics; and we wish Colonel Higginson would discuss it from this point of view.—*The Nation*.

A Supreme Court decision of importance to farmers and drovers, concerning the sale of diseased cattle, was rendered last week. He who sells diseased cattle forfeits the pay for them, and is liable in damages for the spread of the disease.—*Exchange*.

Early American Farming.

While we contemplate the high excellence and great capacity for work which has been attained in the agricultural machinery of this country, it is interesting to cast a thought backward at the tools used by our forerunners upon American soils. The contrast is startling. At the late meeting of the American Society for the Advancement of Science, held in Boston last month, there was a paper read by a citizen of Illinois concerning the ancient stone implements found in the rich, alluvial soil at the mouths of the Missouri and Illinois rivers, used by the Mound-builders in their rude agriculture. The writer exhibited a fine collection of these implements. They are chipped from flint, or a hard, silicious limestone, and some of them beautifully made. Some are nearly a foot in length and six inches wide at the broader end. Some are made to be fastened to handles, like our modern spades. Others resemble our modern hoes, having a deep lateral notch, to facilitate the fastening to a handle. Some of these stone hoes are made with such ingenuity as to have been effective implements. There were also exhibited stone implements which evidently were made to fasten to some kind of stock, to be pulled through the ground like a plow. As these ancient people had no domestic animals for this purpose, it is probable that manual force was used to perform the work. The broad, cutting edge of these stone implements was highly polished from long use, by the attrition of the soil. These implements of agriculture were in the ancient graves, associated with pottery, some of which contained carbonized corn. Cobs in a carbonized state were found; and it seems probable that these ancient people lived principally on corn and vegetables, which they cultivated to a considerable extent.—*Pacific Rural Press*.

The Railways of the World.

The lines of railways in the five divisions of the earth cost, in round numbers, \$16,000,000,000; and would, according to Baron Kolb, reach eight times round the globe, although it is but little over half a century since the first railway worked by steam was opened between Darlington and Stockton, Sept. 27, 1825, and between Manchester and Liverpool, Sept. 15, 1830. It is shown that in France, previous to the existence of railways, there was one passenger in every 335,000 killed, and one out of every 30,000 wounded; whereas between 1835 and 1875, there was but one in 5,178,890 killed, and one in 580,450 wounded; so that we may infer that the tendency to accidents is yearly diminishing. Railway traveling in England is attended with greater risk than in any other country in Europe. A French statistician observes that, if a person were to live continually in a railway carriage, and spend all his time in railway traveling, the chances of his dying from a railway accident would not occur till he was 960 years old.—*Exchange*.

For burns or scalds nothing is more soothing than the white of an egg, which may be poured over the wound. It is softer, as a varnish for a burn, than collodion; and, being always at hand, can be applied immediately. It is also more cooling than the "sweet oil and cotton," which was formerly supposed to be the surest application to allay the smarting pain. It is the contact with the air which gives the extreme discomfort experienced from ordinary accidents of this kind; and anything which excludes air and prevents inflammation is the thing to be at once applied. The egg is also considered one of the best remedies for dysentery, when beaten up slightly with or without sugar.—*Exchange*.

Our Exchanges.

Sheriff Hunter informs us that the fees of his office for this year will not, after making due allowance for an increased business from now until Jan. 1st, amount to \$400. A county without any saloon or jail, like Brown, doesn't give the sheriff much of a bonanza.—*Hiawatha Dispatch*.

The railroad company has established a station eight miles east, midway between Speareville and Dodge City. A town will be built up, and will be named Ridgeway. It is stated that the company will locate shops there, and that the county seat of Ford county will be removed there.—*Hutchinson News*.

Now is the time to guard against prairie fires. Mr. Hansome, the efficient railroad section boss, writes us that the railroad hands had their clothes burned, from a stray spark from an engine; and that they were destroyed before help could reach the spot, only three hundred feet away.—*Larned Chronoscope*.

Mr. McCampbell is still at work at his salt well. He feels certain that in a short time he will be able to make one hundred barrels of the best salt each day. There is no reason why the salt in this well should not be used; for it is certainly there in great abundance, and needs only capital to make it a paying institution.—*Wichita Republican*.

The brick-kilns of this city, three or four in number, will draw their business to a close after a burn or two. A large amount of brick has been burned this season, and more used than any previous season. Some 700,000 more are needed to complete buildings now in progress. The business will open up strong again next season.—*Marysville Wrecker*.

The crop of corn now being harvested is the largest ever grown in this county, by several hundred thousand bushels. The hog crop is proportionately big. Cattle feeding this winter will be managed on a larger scale than at any time heretofore. The wheat crop is good. In brief, Brown county will have greater cause for observing Thanksgiving day than she ever had.

We are informed, by a gentleman from Tennessee, that ten years ago about ninety persons left that State. About seventy of them settled in Kansas, nearly all in this county. The others went to Colorado. There was no difference between the parties as regards health; but, of those that went to Colorado, one-third have died, while there has been no serious sickness among those that settled in Kansas.—*Abilene Chronicle*.

Mr. Ott, of Offerle, Kas., brought to this office a sample of the new sugar made at the new sugar factory at Larned. It is just as it came from the mill, and is about of the color of ordinary brown sugar. It can, he says, be whitened so as to be almost equal to white sugar. The factories now at Larned are sufficient to use thirty acres of corn per day. Enough is now known to know that sugar-making can be made a success in Kansas.—*Topeka Commonwealth*.

As stock-raising is becoming the principal pursuit, a reliable and profitable winter food for stock must be grown. W. J. Colvin, a well-known sheep breeder, says: "I am more in favor of pearl millet than I have been formerly. It is a much more prolific crop, and the fastest grower of any crop I have had on the farm this season. All kinds of stock appear to like it better than either corn, millet, or sorghum. It thrives on thin soil as well as any other crop. It does not root as deep as corn or sorghum. It starts much sooner after cutting than either, and could be cut several times in a season.—*Dodge City Times*.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 30, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Farmers' Clubs.

The club, once suggestive of mere jollity, is of late years more generally a union in some thoughtful work. Name a club, and its object is asked for,—political, scientific, social, or commercial. Among these interesting signs of a brighter and broader civilization, farmers' clubs are gaining a name and an influence. Simpler and less constrained than the great union of granges, they can do more in certain lines of thinking and acting. The grange, in object, organization and machinery, is adapted to the consideration of a few questions of wide-spread interest. It stands as an organized army against opposing interests, but seldom reaches the details of local farm life. It needs, at best, the supplement of a simple club, where mutual sympathies in details draw out the individual experiences and inmost thoughts of neighbors and friends.

THE OBJECT.

Such a club limits its object to a better knowledge of farming in those details most interesting to its members. For this end, it calls out the varied experiences of a dozen or twenty men, every day busy with the things of which they talk. It soon teaches men to distinguish between the facts of experience and the conclusions drawn from these facts. Mr. A always plows shallow, and believes that his good crops are due to the practice. Mr. B is satisfied that if farmers would drill corn instead of planting in hills, they would increase their crop; for he raised the finest crop he ever saw in that way. A few exchanges of experience and views help amazingly to correct the theories which the most limited experience encourages; and many questions of practice may be settled to the satisfaction of all.

After these mutual improvements in thoughtfulness are felt, it is possible for the same men to undertake direct experiment in lines already suggested by experience, or to go in search of information from sources before unthought of. The researches of science gain a meaning and an interest; and the world of work is a study too. Real thinking finds its proper place in agriculture.

The machinery of such a body is the simplest possible. A few neighbors find their mutual interests and sympathies drawing them into confidence; and, choosing a place of meeting suitable for its convenience and comfort, they select their few officers, appoint a committee or two, provide a record book to hold their necessary articles of organization, and are fully equipped for business.

IN METHODS,

they follow the same simplicity. Meetings must be at regular intervals, for the sake of attendance without previous painstaking notice; and neither so frequent as to be burdensome, nor so infrequent as to lose the interest of succession. Once a month seems usually to best hit the mean of extremes. The proceedings should be orderly enough to insure progress, yet never so formal as to suggest the debating society or the caucus. The less there is of voting, beyond a general free expression of opinion, the better. Few set speeches should be asked for; but the familiar question and answer should be always in order. Once in a while a member should be asked to prepare a clear statement of practice or belief, or a summary of others' views upon a particular question already somewhat dis-

cussed before the club. Such papers should become a part of the property of the club, to be freely discussed, and afterward preserved for reference and information. The combat of argument for the sake of victory, so often the child's play of debating societies, should have no place in the free and easy conversation which best calls out truth.

If possible the records of such a club should have permanent interest; and the task of an efficient secretary should be no slight one. A device for gathering the many items which concern a single subject, so that after-reference is easy, is helpful to him. Occasionally the club does well to divide for a time into committees, or sections, for work, observation, experiment, or reports, so that each may find his best field. Such a plan leads to that division of labor so productive of results everywhere; and brings out the best energies of individuals, for the benefit of all.

THE RESULTS

can be easily pictured without any experience. Such interchange of thought and work must build up interest in the calling, interest in its minute details of drudgery, and zeal for a progressive farming. It must bring added ability with each year; and the rising generation gains an impetus that can not be measured. It develops such ideas of quality, in crops and stock and tools, as brings the truest because surest profits. Such is its nature.

But such effects are realized in scores of neighborhoods. Some of these have a wide reputation for thrift, wealth, efficiency and comfort that make them attractive to immigrants, as well as to neighbors and sons. In Michigan, the farmers' clubs of Adrian, Armada, and Volinia, have for years given character to the agriculture and the agricultural prosperity of their vicinity. Who shall say how much our own Riley county owes to its similar associations, stimulating progress in stock-raising, fruit-raising, and tree-planting, as well as in general farming.

This coming winter, when all political contests are decided, let us inaugurate a four years' reign of peace, by organizing such clubs in all the stabler communities of the State.—*President Fairchild.*

Telegraphy.

We are being asked, quite frequently, questions like the following: "Do you think I can learn telegraphy?" "How long will it take me to learn telegraphy?" etc. In answer to the first, we would say that, without having a personal acquaintance with your abilities, it would be hard to tell. We can give you an idea, perhaps. To learn telegraphy, you need the ability to concentrate your mind upon a given subject, and at the same time be oblivious to everything around you: you need a fair knowledge of the English language, a quick ear, a ready hand, and patience. These are the symptoms; and if, after a careful examination, you find that you have any or all of them, you may hope.

If your powers of mind are such as to enable you to sit in a machine shop where boilers are being riveted, and read a book, noting every word and sentence, and at the same time get a clear understanding of the author's meaning; if you can sit down in the midst of a cyclone, and write a letter in the highest style of the art, putting in all necessary capitals, punctuating well, and spelling each word correctly, and yet not say anything about the cyclone in your letter,—you may consider that you have this symptom pretty bad.

It has been frequently asserted that "any one who can learn music, can learn telegraphy." Some go farther, by saying that

"any one who can whistle a tune, can learn telegraphy." The latter statement seems much too comprehensive, for the reason that it includes about all of the American people; and our experience teaches us that there are some people in America who can not learn telegraphy. If the first statement were made over into, "Any one who has learned telegraphy, can learn music," it would sound more plausible. Personally, we have had no musical training, except that which distinguishes every American citizen,—the power to whistle "Yankee doodle;" but, judging from what we hear of the one and know of the other, we are able to trace sufficient resemblance between them to lead us to think that a person who has learned one may learn the other.

A fair knowledge of English means an acquaintance with all English words possible. There is nothing so perplexing to a young operator as the receiving of a word of which he does not know the meaning. There is nothing that will cause him to lose so much time; and time with an operator literally means money. He may get all the letters in their order; but, if he has never seen the word before, he does not know whether it is right or not, and so has it repeated, thereby calling down a blessing the length of the line upon himself, from the sending operator. Herein lies the difficulty experienced by young operators in receiving cypher messages. If the cypher is in English words, you may know whether they are right or not, even if you get no idea of the meaning of the message, because they are English words and you know how to spell them. Should you aspire to the height of many young operators' ambitions,—to become a "commercial man,"—you must have a considerable acquaintance with words, on your path upward in the profession will be a hard one, for you will have to learn your English as you go; and the chances of your remaining a "plug" will be about a "solid 138" of a possible 150.

The ability to distinguish slight modifications of the same sound is necessary. The signals are only repetitions of the same sound, differing only in length. Considerable skill in the use of the pen is also required. In receiving a message, you must "put it down" on paper. No matter if your writing does look like the pathway of a weary fly just emerging from the ink bottle. No matter how you write, so you do it rapidly, and are able to read it after it begins to cool. The next best thing to do, is to put in your spare time in improving your handwriting. Now patience, patience well developed, is a good symptom. If you have an inexhaustible supply of patience, you may in time be able to control a wandering attention and refractory hands, and become an operator. There seems to be an idea abroad, that, if the average operator ever had any patience, he must have exhausted it in learning the business. Well, it does require a good deal of patience to learn the business; but it requires much more to stand behind a receiving counter and be made the target of all the questions that a "cold and heartless world" may see fit to ask. Therefore, we say, if your supply is inexhaustible, you may hope to become an operator. Almost every one can learn the telegraphic alphabet, and acquire enough of skill to send and receive slowly,—say from 6 to 15 words per minute; but only those who have special ability in this direction, can go much farther. It is practically impossible to learn telegraphy without assistance. A person cannot send for himself to receive.

Under the most favorable circumstances, you will require from six months to one year in which to learn. Some learn in less time than this; but they are the exceptions, not the rule. If you have the facilities and the time necessary, and do not learn in a year, you had better give it up and become a book agent, or go into some other more paying business.—*Sup't Graham.*

Educational Gossip.

The school statistics of Shawnee county show an increase of 1,500 pupils during the last year.

W. H. Walker, editor of the Peabody Reporter, died at his home in that city, October 20th.

The new school building at Salina is nearly completed. Some of the rooms are occupied already.

The Blue Rapids paper-mill is in running order again, with over twice the capacity possessed before the fire.

Of forty persons in Trego who have recently declared their intentions to become naturalized citizens, every one was able to sign his name.

Allen G. Campbell, who gave \$10,000 toward building the Holton University, is a candidate for delegate to Congress, on the anti-Mormon ticket, in Utah.

The county commissioners of Lyon county have prepared a proposition to build an insane house at the county poor farm, for \$1,500, which is to be submitted to the voters.

A colored man has sued the Board of Education at Topeka, for refusing his children the privilege of attending Clay school, while white children of the same age were being received there without any objection.

Superintendent McDonald, of Shawnee county, has visited, during the last school year, seventy-seven out of the seventy-eight schools in session in his county, excluding the city schools. McDonald is an enthusiastic educator.

Prof. Wolf, of Wyandotte, Kansas, is gathering material for a historical painting for the legislative halls. Prof. Wolf is an artist of fifty years' experience, and is the author of Wolf's Panorama of Paradise Lost, painted at Cincinnati, Ohio; and his portraits of Abraham Lincoln are pronounced the best in the United States.

The Cherokees have over eighty common schools. The Chickasaws have four public and about ten district schools. The Choctaws have two public and over fifty district schools. The Creeks have three public and about thirty district schools. These tribes are our nearest Indian neighbors; and no wild Indians are nearer than 200 miles of Chetopa.—*Chetopa Settlers' Guide.*

The handsome new reform school, which is being built about three miles north of Topeka, begins to assume something of its completed shape. The slate roof is being put on; and a good deal of glazing and painting has been done. The distance at which it is located will make the spot a favorable one for drives, especially since the road is a good one and can be made very pleasant.

The women of New York State are entering actively the campaign for school officers and to hold school offices. At Mount Morris, Mrs. Marson, Mrs. Frances Hale Seymour and Mrs. Marson Bingham were nominated for members of the Board of Education, by a meeting of citizens. Their speeches and arguments are interesting to a Kansan on account of their frequent references to our "excellent" system of education, our female superintendents, and the democratic nominee for the State Superintendent's office,—Miss Sarah Brown.

The Thirteenth Annual Meeting of the Kansas Academy of Science will be held at Topeka, Thursday and Friday, November 11th and 12th, 1880. The business meeting will be held at 3 o'clock P. M., of the 11th, at the office of Dr. A. H. Thompson, No. 237 Kansas avenue; and the other meetings at the Senate Chamber of the State house. Numerous papers on scientific subjects will be presented; and a full attendance of the friends of science is requested. The railroad ticket agents at Topeka will sell return tickets at reduced rates to persons in attendance who have paid full fare in coming. The usual reduction in hotel rates is expected.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 30, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Mr. T. B. Morgan, foreman of the farm, visited friends at Bala, on Friday of last week.

Within the last three weeks, the Farm Department has hauled to the fields no less than 105 loads of farm-yard manure.

The Faculty decided, at the meeting of yesterday, that the next monthly examination should be held on November 19th instead of November 12th, as previously announced.

The *Kansas Farmer* comes to us this week in the full glory of a new and highly artistic head, which we hope may be taken as a safe indication of the increasing prosperity of this reliable agricultural and family journal.

After next Tuesday, the names of Messrs. Garfield, Hancock and Weaver will cease to have any especial attraction for the American editor; and, let us be sufficiently thankful, we shall no longer be obliged to look over 475 exchanges for a single non-political item of general interest.

The four-year-old heifer, "3d Grace Young of College Farm," sold by the College last week, weighed, on reaching her destination, 1,670 pounds. Considering that this heifer was taken almost directly from the pasture, having had no grain for nearly a year, the above fact may be considered as furnishing a strong argument in favor of Short-horns in Kansas.

We are under obligations to Professor J. M. McBryde, Professor of Agriculture of the University of Tennessee, for the report of experimental work done in his department during 1879-80. This pamphlet ought to have a very wide circulation among the farmers of Tennessee. We notice that Prof. McBryde considers that our Kansas Rice corn is worthy of the attention of Tennessee farmers.

The worst-scared *Mephitis Americana* ever seen in these parts, emerged from obscurity beneath the sidewalk, on Tuesday morning, just as a company of young ladies were passing from Chapel. The unearthly shriek that greeted his skunkship's appearance, called to mind the massacre of Cherry valley, and the time "when Kosciusko fell." The *Mephitis*, it need hardly be said, did not tarry to offer his usual compliments.

During the week, several substances have been analyzed in the Chemical Laboratory, for parties in various portions of the State. Fine magnesian limestone was supposed to contain magnesian carbonate in sufficient quantity to be a profitable source of the salts of magnesia. The analysis was made for the purpose only of determining its commercial value. Its composition is as follows: Calcic carbonate, 91.91; magnesian carbonate, 1.50; insoluble in strong hydrochloric acid, 6.22; undetermined phosphoric and sulphuric acids and loss, .37. Three samples of black sand were of great interest, because of their difficult solubility. They consisted in varying proportions of river sand and oxide of iron. One contained fragments of ferric sulphide.

Immediately after rhetorical exercises, we adjourned to Society room, to find it already filled with eager, expectant faces. Society was called to order by the President. Miss Thrasher and Messrs. Thompson and Coran were initiated. Extemporaneous speaking was participated in by both Alpha Betas and visitors. Our new question-box seems to be quite an improvement on the old way of passing slips. We were twice favored with fine music selections by the committee. Unusual preparation seemed to have been made in the order of declamation, essay and select reading;

and these exercises were received with the hearty applause of the audience. Greater interest was manifested in the debate than we have ever before seen in the Society. The judges rendered a decision in favor of the negative. Debate next week will be conducted by Messrs. Pence, McNair, Kern, and Willard. The *Gleaner* will be presented by Miss Fairchild and Mr. Ward. A cordial invitation to visit our Society is extended to all.

M. E. M.

In consequence of the political rally on Saturday night, the Webster Society was not very largely attended; yet we held a meeting, and a very interesting one too. The debate on the question, "Resolved, That a man's character is exalted more by qualities of the heart than of the brain," was decided in favor of the affirmative. Because of representatives in the Society of all political parties, extemporaneous speaking becomes very lively, especially with our Grant fanatic. The editor not appearing, the *Reporter* was not presented as expected. It will be read at the next meeting. Question selected for the next debate, "Resolved, That a man will do more from pride than necessity." On the programme is the name of Edwin Fairchild for declamation, and Chas. F. Bailey for composition.

CESAR.

Last spring fifty plants each of fourteen varieties of strawberries, were planted in rows side by side on the grounds of the Horticultural Department. The plants were equal in respect to quality and strength, as far as could be seen, and were treated exactly alike. The weather following the planting was very dry; and the newly set plants, besides being well puddled at planting, were well watered once or twice afterward, the earth being drawn away from the crowns and the wet surface covered with dry earth, after the water had settled. Afterward they received the usual care and good cultivation.

A survey of the rows at this time shows a striking difference in the results of the summer in these fourteen cases. The plants of Downer's Prolific, Chas. Downing, Napoleon III., Lovey's Seedling, all or nearly all survived; and the rows devoted to those varieties are now well covered eighteen inches wide with the plants. Of Crescent Seedling and Triumph de Gand, about one-half of the plants lived and increased. About one-fifth of the plants in rows devoted to the Metcalf, Great American, and French's Seedling, survived; and the remaining varieties,—Cumberland Triumph, Wilson's Albany, and Nicanor,—are entirely dead. These results are of course not conclusive; but are worth noting in a comparison of the vitality of the different varieties included in the experiment.

The arrangement of offices and calls for the present term, on the College telegraph line, will be as follows:—

OFFICES.	CALLS.
Kingsbury.....	K.
Blades.....	X.A.
Mackey.....	Ni.
Fairchild.....	Pz.
Hunting.....	H.N.
Buchli.....	Bu.
Call.....	CH.
Short.....	W.
Sup't's Office.....	G.
Mechanics' Building.....	MB.
Chapel Building.....	CB.
Boutwell.....	A.
Leach.....	DS.
McKerlie.....	MA.
Fowler.....	RK.
Lewis.....	X.
Richards.....	D.
Rogers.....	RA.
Campbell.....	UN.
Post-office.....	PO.
U. P. Depot.....	MN.
Wilder.....	BN.
Whaley.....	J. & W.
Strong.....	RS.
Wahl.....	F.
Smith, Op'r at Mn.....	S.
Campbell, Op'r at Mn.....	C.
Cotton.....	UC.
Evans.....	SA.
Hamilton.....	Q.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. WM. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WARREN KNAUS, President.

GEO. F. THOMPSON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations. I. D. GRAHAM, President.

G. H. FAILEYER, Secretary.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering, Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange is sued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Agricultural College Lands.—These lands are in the market, as provided by law, and for sale for one-eighth cash, balance in seven equal annual payments with ten per cent interest, payable annually. The lands are all choice selections, and prices range generally from \$5.00 to \$6.25 per acre. Some of the best tracts are appraised at from \$8 to \$10 per acre, and they are well worth the money. These lands are located in Washington, Marshall, Clay, Riley and Dickinson counties. For particulars, maps and descriptions, address L. R. Elliott, Agent, Manhattan, Kas.

THE INDUSTRIALIST.

SATURDAY, OCTOBER 30, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible, in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Elliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE.

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE.

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

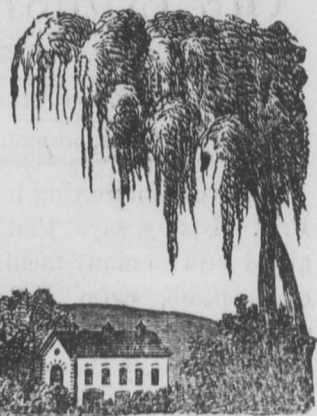
Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead" and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

THE INDUSTRIALIST



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J. E. PLATT, Prof. Elem'y English, Mathematics.
JNO. D. WALTERS, Teacher Industrial Drawing.
T. T. HAWKES, Sup't Mechanical Department.
A. A. STEWART, Sup't Printing Department.
I. D. GRAHAM, Sup't Telegraph Department.
MRS. M. E. CRIPPS, Sup't Sewing Department.
W. L. HOFER, Teacher of Instrumental Music.

THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Unscientific Science.

The Chicago Times says of Prof. Francis Bowen's "Gleanings from a Literary Life:"—

"No reader of current science and speculation, who has not become infatuated with its persuasive pretensions, can have failed to observe how strenuously that school insists on what it calls the 'scientific method,' in solving all questions which it takes up for discussion; and with what curious laxity of reason that injunction is discarded by the majority of those to whom it is directly addressed. To be scientific in reaching conclusions, a careful man will examine keenly his chief proposition. He will scrutinize all the evidence that may be obtainable in its affirmation or denial; he will not consent to accept evidence the nature of which he cannot understand; he will not concede as demonstrated truths assumptions whose demonstrations into truths he has not seen and cannot discover; and he will insist on a palpable distinction between presumption and demonstration. It is within the knowledge of all observing persons, that the adherents of the prevailing fashion in belief concerning the origin of man and his derivation from any kinship with the brutes, include many who cannot have had fair opportunities for acquiring scientific habits of thought; and who, therefore, are the more easily persuaded that any school setting up a scientific standard is necessarily a scientific school, incapable of fallacy, infallible in logic, unerring in inference, absolutely accurate in fact. The unscientific reader is easily won over to the conviction that, by accepting the dogma of such a school, he, too, becomes scientific without the aid of those old-fashioned means which, in less enterprising days, were essential to learning and scholarship,—years of study, patient examination of conflicting testimony, arduous investigation by exact agencies, and a modest acceptance of the labors of generations of able, honest, and learned men, as, perhaps, superior to his own attainments of a week or two. The scientific method of thought, for the investigation of current hypotheses, is not thus to be acquired. The theory of the identity of mind and nervous system put forth by Bastian, demands, for its just appreciation, a knowledge of physiology, such as only specialists can have, yet Bastian's conclusions are enthusiastically adopted by those who never touched the hem of that study. The skillful physiologist pays less attention to Bastian's theory of nerve evolution than to his confession that physiology is in its infancy, and cannot afford to be dogmatic toward other sciences. How many of those who accept Hæckel as an authority are acquainted, even superficially, with the so-called science of embryology? And how easy it is to forget that from the amplest data of the same class an Agassiz drew conclusions the very reverse of Hæckel's! How many who imagine, from fragmentary reading, that the Darwinians have shown a direct progression in species culminating in man, can state how much verification of this is supplied by paleontology? What believer in the evolution of man from a higher brute can dispose of the overwhelming facts against it in 'Man and Apes,' by St. Geo. Mivart? There surely never was a scientific theory which obtained so ready a credence in so unscientific a way as this revised hypothesis of evolution."

THE dairy interest of the United States represents an investment of upwards of \$1,300,000. The annual butter and cheese production is \$350,000,000. The number of pounds of butter made in 1879, as near as can be ascertained from the returns such as are made, was 1,500,000,000.—Exchange.

Economy in Farming.

In Scribner's Monthly for October, Sidney Lanier points out (article "The New South") one of the secrets which make the difference between profitable farming and unprofitable farming. There is a lesson for the Northern farmer, as well as for the Southern:—

The phrase "small farming," used of the South, crops out in directions curious enough to one unacquainted with the special economies and relations of existence in that part of our country. While large farming in the South means exclusive cotton-growing, — as it means in the West exclusive wheat-growing or exclusive corn-growing, — small farming means diversified farm products; and a special result of the Southern conditions of agriculture has brought about a still more special sense of the word, so that in Georgia, for example, the term "small farmer" brings up to every native mind the idea of a farmer who, besides his cotton crop, raises corn enough to "do" him. But again, the incidents hinging upon this apparently simple matter of making corn enough to do him, are so numerous as, in turn, to render them the distinctive feature of small farming. Small farming means, in short, meat and bread for which there are no notes in bank; pigs fed with home-made corn, and growing of themselves while the corn and cotton were being tended; yarn spun, stockings knitted, butter made and sold (instead of bought); eggs, chickens, peaches, watermelons, the four extra sheep, and a little wool, two calves and a beef,—all to sell every year, besides a colt which is now suddenly become, all of himself, a good serviceable horse; the four oxen, which are as good as gifts made by the grass; and a hundred other items, all representing income from a hundred sources to the small farmer, which equally represent outgo to the large farmer,—items, too, scarcely appearing at all on the expense side of the strictest account-book, because they are either products of odd moments which, if not so applied, would not have been at all applied, or products of natural animal growth and grass at nothing a ton. All these ideas are inseparably connected with that of the small farmer in the South.

American Wheat in Russia.

Last month, two American steamers laden with grain entered the port of Revel, for the purpose of discharging their cargoes, — a circumstance hitherto without precedent in the annals of Russian commerce. A St. Petersburg letter to us, received a few days ago, says that it has hitherto been a firmly established article of faith, in the Czar's dominions, that Russia would never need to import cereals from other countries. So rapid, however, has of late years been the falling off in productiveness, exhibited in the agricultural districts of the empire, that the seemingly impossible has at length come to pass; and northern Russia is importing wheat from the United States. It is but justice to the Russian press to acknowledge, that it has been profuse of warnings with respect to the probable consequences of slovenly and unintelligent farming, persistence in old-fashioned and exploded systems of cultivation, reluctance to invest capital in modern agricultural improvements, absenteeism and other laches, which have practically disqualified Russian grain-growers from competing for foreign custom with their trans-Atlantic rivals. But Russian boyars and peasant farmers alike were so immutably possessed by the conviction that Russia was the predestined granary of Europe, that they calmly ignored these salutary monitions. They are now stricken with amazement and consternation by proof positive, such as is afforded by the importa-

tion of American grain into Revel, that the cereal yields of northern and central Russia no longer suffice to meet the consumptive requirements of the native population. Germany, too, is giving to America the preference over Russia for what grain she finds it necessary to import from abroad, on the reasonable grounds that the American wheat is at once cheaper and of better quality than the Russian. On the whole, Russian agriculture is just now at an extremely low ebb; and its future promises to prove even gloomier than its present.—*Prairie Farmer.*

Our Exchanges.

The Omaha Republican gives a detailed statement of this year's cattle drive, the total reaching 301,000.

The section men report finding prairie chickens along the track with their necks broke. The birds fly against the telegraph wire with such force as to kill them.—*Onaga Journal.*

The Hiawatha Dispatch says there were 90,990 acres of corn raised in that county this year, with an average yield of 60 bushels to the acre, and that the price is 20 cents a bushel; so the farmers' hearts are glad.

Alex Wright, of Exeter township, has left with us twelve Irish potatoes, of the peach-blow variety, that are the finest specimens of the "Irishman's bread and meat" that we have ever seen. They fill a peck measure, weigh eighteen pounds, and are otherwise astonishing in their proportions.—*Clay County Dispatch.*

Capt. T. C. Honnell and his brother had over one hundred bushels of apples each, on trees only ten years from planting, in this and Brown county. One twig had ninety apples, each weighing twelve ounces. The twig was only one and one-half inches at the body of the tree. This was only a specimen of many.—*Atchison Champion.*

In order to make home more cheerful and attractive for her husband, one of the ladies of our city has made provision for having her parlor floor covered with saw-dust, and will furnish the room with three or four round tables, and a counter also, with decanters and a keg of beer behind it. She has also hired two common street loafers to sit around and fill the room with tobacco smoke.—*Salina Journal.*

The average yield of corn, says the New York Times, is less than one-half of the possible yield. When one thinks how little the second half of 100 bushels of corn costs per acre, the profit of growing such a crop becomes apparent; and it is easy to produce such a yield. One wants the right kind of corn, good land, and a little extra work in cultivation. The cost of the land, and of planting and tending the crop, is the same for 20 bushels as for 100 bushels per acre.

The cases against certain conductors on the Union Pacific road, in which they were charged with having defrauded the company by selling tickets which had been once used, have been before the courts in Denver; and the accused parties were released from custody upon giving bail in the sum of \$100 each. One of the persons said to have been implicated, and who was arrested, was John Phelps, one of the oldest conductors on the road. He passed through the city yesterday, going home; and was heartily congratulated upon his release, by a number of his friends who happened to be at the depot, as he had been at every station along the road, west of here. It is understood that the holding of the accused persons to bail in the small amount fixed by the court, is a virtual disposal of the cases, and that the charges will be nolle prossed.—*Topeka Commonwealth.*

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 6, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

In a very interesting lecture upon snakes, Prof. Huxley says that few animals are gifted with so many faculties. It can stand erect, climb, swim, and leap. Their destructiveness to man is illustrated by the fact that twenty thousand human lives are lost annually in India alone, by their poison. Owing to a curious anatomical structure, he cannot properly be said to swallow his prey, but works it down gradually. For this purpose, he requires greatly developed salivary glands. The poison-bag of the venomous snakes is only a modification of the salivary glands of harmless species; the structure in most cases being nearly identical, while the fangs that convey the poison are but variations in the tooth possessed by these in common with harmless snakes. The fact that the poison of deadly snakes is formed in the salivary glands seemed to point out the direction in which to seek the cause of snake poisoning, and the direction in which to discover antidotes against it. At present, the bite of the cobra cannot be healed, except by cauterization in very fresh cases. The bites of other snakes may be healed.

THE following facts regarding the weather during the month of October, just passed, have been gleaned from the College meteorological records:—

The month has been medium, both as to temperature and rainfall. The rainfall for the month was 2.20 inches. The average precipitation for October at this station is 2.13 inches. This rainfall was distributed as follows: On the 1st, .96; 2d, .14; 10th, .16; 11th, .24; 12th, .68; and .02 on the 13th. The .68 of an inch that were collected in the rain-gauge on the 12th, fell in half an hour. The mean temperature of the month was 51°.93, which is 1°.42 below the mean. The mean at 7 A. M. was 46°.03; at 2 P. M., 62°.84; at 9 P. M., 49°.84. The maximum temperature was 81°, on the 9th. This was also the warmest day, 70°.7 being the average for the day. The lowest temperature, 23°, occurred on the 31st; but the 17th was the coldest day; mean of the day, 35.7. The first killing frost of the season occurred on the 4th. The mercury stood at 32° or below on ten different days during the month. The mean height of the barometer was 28.69 inches; highest barometer, 28.98; lowest, 28.21, without correction for altitude.

That Big Potato.

Our exchanges at this season fairly teem with locals descriptive of the big potatoes, squashes, pumpkins, or turnips grown usually in the vicinity of the town in which the newspaper publishing the item is printed. These items always interest us; and very often we transfer them to our exchange column. But we are by no means satisfied with the fact that John Smith has succeeded in growing a potato weighing four pounds. We want to raise such potatoes ourselves; and so does every farmer who reads this item. But, in order to do this, we must follow the true method of potato culture; and this we can only arrive at by a slow process of experimentation, carried through a number of years, unless Mr. Smith can be induced to give us his plan, which it is to be presumed is the true one.

What we want are the facts of experience, and not a simple statement of results. If every farmer in the State who has had

exceptional success in any branch of farm labor, could be persuaded to give the readers of his local paper his experience, the agriculture of the entire State would be advanced immeasurably. We want to know the variety to which this big potato belongs; what kind of soil it grew in,—whether sand, clay, or loam; when and how many times the ground was plowed; what kind, if any, of manure was employed; and how often the crop was cultivated or hoed. Facts of this kind have a money value, and by all means let us have them.—Prof. Shelton.

Pearl Millet.

This plant has been cultivated on a limited scale, in this country, for many years, and with very varying results. Within the last two or three years, it has received much attention at the hands of agricultural writers, who have vied with each other in lauding it to the skies, and visiting upon it wholesale condemnation.

For the purpose of testing pearl millet, we last year planted four rows each about thirty rods in length, cultivating it two or three times during the period of its early growth. By the side of the pearl millet, we also grew several rows of common millet, golden millet and Hungarian millet. From the combined action of drouth and chintz-bugs, these last were an almost total failure, while the pearl millet was scarcely affected by either. The growth made by the pearl millet was simply wonderful. Every seed seemed to send out a great number of shoots (in some cases as many as thirty); and some of these measured over ten feet in height.

It should be remembered, too, that, unlike the common sorts of millet, pearl millet yields several cuttings during the season, the number depending upon the fertility of the soil and the amount of rainfall. We are confident that this plant will yield two or three times as much fodder as sowed corn; and the quality of the fodder seems much better than either corn-fodder or millet. Kansas farmers generally will find it worth while to give pearl millet a trial next season.—Prof. Shelton.

A Cow that Paid the Rent.

That blooded stock do well and pay well, is one of the best-established facts of Kansas agriculture. There are some scores of well-established herds of pure-bred stock in the State, whose owners reap much pleasure, and large profits financially, from the business of breeding; but the facts which make up the experience of breeders and farmers generally, are not often accurately understood, and when known are rarely made public. For the sake of putting a fact of this kind on record, and in the hope that our experience may afford encouragement to young breeders, we give in this article a brief chapter of our experience on the College farm in the breeding of Short-horns.

In the summer of 1873, the College purchased, at the sale of Andrew Wilson, held at Kingsville, Kansas, the Short-horn cow, Grace Young 4th, a well-bred three-year-old of the "Young Mary" family of Short-horns, bred by Jas. N. Brown & Sons, of Berlin, Illinois. The price paid, \$800, was a round one, even for those times: plenty of equally well-bred cows could now, without doubt, be obtained at prices varying from \$250 to \$500. Since this cow has been in the possession of the College, she has produced four heifers and one bull. The bull was sold when a yearling, to go to Coffey county; but the four heifers, all of which are regular breeders, remain the property of the College.

Of the direct descendants of this cow, on the dam's side, we have sold within five years four bulls and four heifers, receiving for them cash to the amount of \$1,135, or an average price of \$141.85 per head. Considering that the cow was purchased when the prices of Short-horns ruled higher than ever known before, and that all the sales referred to above were made during a period of great depression in Short-horn prices, the above facts must be considered as furnishing reasonable assurance that the breeders of good Short-horns are standing on solid ground.

But this is not all. The College still owns five cows and heifers and two bulls, direct descendants of this cow; and, if we price these less in some cases than we have been offered, these animals are worth \$1,025. Adding this to the \$1,135 received, and we have a total of \$2,155 received from the produce of this cow within six years and a half from the time she began breeding, a fact which places her among the true "rent-payers," we believe.—Prof. Shelton.

The Geological Survey Again.

In the early part of the summer, an article appeared in this paper urging the importance of a geological survey of the State. Many leading papers of the State took up the subject, and universally, so far as I know, favored it. But, when the very men upon whose votes all depends, were before the people for election, nothing was heard of the matter. This is generally the case. In the heat of political campaigns, non-partisan issues are lost sight of. Those things upon which all parties can unite are not the topics for stirring leaders. But, now that the elections are over, and the party feeling, that almost alone guided in the choice of even the least important county offices, is abating, it may not be out of place for the dear people to consider wherein their real interests can be promoted by those who, during the canvass, were so willing to serve them.

A legislature is generally willing to incorporate any principle into the law, or to authorize any expenditure, approved and desired by the people. We hope those who before seemed so earnest in urging this matter of the geological survey, may agitate the matter again before the meeting of the Legislature, that favorable action may be had at the next session.

There is but one objection that can be urged against the survey: this is the great expense. There will surely be considerable expense connected with this work; but the real question to consider is, whether the expense is justified by the benefits derived from it.

I know that the word geological will frighten some timid persons. They associate this word with decayed bones and fossil-marked stones only, and cannot see what it is all for, any way. It will do for a few seeming monomaniacs to spend their time on such matters, so long as they individually are at no expense. But these same parties are always more than willing to profit by any discoveries made. We think that, were the increased knowledge of the geological history of our State the only thing to be gained, the expense would be fully repaid. But this strictly scientific phase of the subject is by far the least important and obtrusive. Our undeveloped resources demand this assistance from the State. The people of the central and western portions of the State especially, are anxiously striving to solve the problem of the existence of coal, or other valuable deposits, in their midst. But private enterprise is always the most costly and, at the

same time, the most unsatisfactory method of determining such matters.

In this particular only are we behind other States. Our people have made unexampled sacrifices in building school-houses and maintaining schools in them; and we are confident that, with the subject properly presented by our State and local papers, a geological survey will receive the favor which it demands.—Prof. Failyer.

Educational Gossip.

Parsons has a free reading-room.

Abilene is talking about starting an art club.

The Nickerson schools are having a vacation, on account of the prevalence of the scarlet fever.

Prof. H. C. Speer, of Junction City, has been elected State Superintendent of Public Instruction by a large majority.

The debates of the literary society at Harmony, in Butler county (ominous names), concluded, the other evening, with club arguments and fist reasons.

The county superintendent of Osage county has been teaching school while in office; and now comes a paper of his county and says that he should not get his pay, on account of the illegality of his certificate.

It is a hard thing to say, and many an ardent temperament may be dampened by it, but it is nevertheless true, that it is more honorable to make a good pair of shoes than to write a poor poem. If this fact could be emphasized, some people would drop the pen and take up the awl; and the world would be better for the change.

Down at Independence, they are having very serious trouble with the colored people. The whites have separated their children in the public schools, and the blacks have instituted suit against them for violating the school laws. A long and expensive trial will undoubtedly be the result. We fear this is but the beginning of trouble of this kind all over the State.

St. Joseph has a social club called the Elite; and Topeka has blossomed out with one christened La Gaiete. Now, Atchison ought to come to the front with a Creme de la Creme club, after which Leavenworth will be afforded an opportunity to organize a Bon Ton or a Haute Ton club. There is nothing like having a high-toned name, even though the name be a trifle more high-toned than the club.—Champion.

The election of last Tuesday resulted in a victory for the Republican party in almost every county of the State; and, as a consequence, many of the present county superintendents are re-elected for another term. Davis county has re-elected J. A. Truex; Saline, Wm. Bishop; Riley, Prof. Lee; Dickinson, A. M. Crary; Jackson, Mrs. Stout; Marshall, Dr. Boyakin; Cowley, R. C. Story. From many counties, we have not heard yet. Jefferson county has elected T. S. Oliver; and, in Douglas county, Prof. Dinsmoor succeeds Miss Sarah Brown, the present incumbent and the Democratic nominee for re-election. Linn county has elected Geo. W. Jones; Shawnee, Prof. L. T. Gage.

The following rather curious piece of composition was recently placed upon the blackboard at a teachers' institute, and a prize of a Webster's Dictionary offered to any person who could read it and pronounce every word correctly. The book was not carried off, however, as twelve was the lowest number of mistakes made in pronunciation: "A sacrilegious son of Belial who has suffered from bronchitis, having exhausted his finances, in order to make good the deficit, resolved to ally himself to a comely young lady of the Malay or Caucasian race. He accordingly purchased a calliope and coral necklace of chameleon hue; and, securing a suite of rooms at a principal hotel, he engaged the head waiter as his coadjutor. He then dispatched a letter, of the most unexceptional caligraphy extant, inviting the young lady to a matinee. She revolted at the idea, refused to consider herself sacrificable to his desire, and sent a polite note of refusal; on receiving which he procured a carbine and a bowie-knife, said that he would not now forge fetters hymeneal with the queen, went to an isolated spot, severed his jugular vein, and discharged the contents of his carbine into his abdomen. The debris were removed by the coroner.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 6, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

A broken press puts this issue of the INDUSTRIALIST three days late, very much to our regret.

The new propagating pit is nearly completed; and every one pronounces it a decided acquisition to the Horticultural Department.

The demand for the College stock seems to be as great as ever. Mr. Wm. P. Higinbotham, the latest purchaser, has secured the handsome half-breed Galloway heifer which was so much admired at the fairs the past fall.

The INDUSTRIALIST "points with pride" to the healthfulness and general salubrity of its little political residence "on the fence." Our "rooster" is not afflicted with "cramp colic," we have no "crow" to eat, and nothing to "take back."

Prof. Ward presented us, for our mineralogical cabinet, a fine specimen of opalized wood, obtained by the Professor while in Colorado last summer; some drippings from the smelters of Leadville; and a piece of pudding-stone found in Wabausee county, this State.

Every farmer ought to take Colman's Rural World. The price has been reduced to only one dollar a year, making it the cheapest and best weekly agricultural paper in the country. Fine premiums are also given for clubs. Send for free sample copy to Norman J. Colman, Publisher, St. Louis, Mo.

The Horticultural Department is indebted to the kindness of Mrs. Albert Griffin, of this place, for a large collection of fine perennials, including a number of choice tea-roses, gladioli, lilies, perennial phloxes, and dahlias. These will form an attractive addition in the ornamentation of the grounds the coming season.

The public exercises of yesterday consisted of a lecture by Prof. Ward. Subject, "Land Tenure, or how John Smith obtains a title to his quarter-section." The lecture was an interesting one, and replete with instruction throughout. The historical references, showing the growth of the idea of the freehold and the condition of land tenure in foreign nations, interested us particularly.

This College is to be pretty extensively diffused next week, according to present appearances. President Fairchild lectures in Topeka, before the State Scientific Association, on Thursday evening; Professors Failyer and Popenoe each read papers before the same Association; and the managing editor of this paper, with a pocketful of INDUSTRIALISTS and a soft, seductive voice for "ads" and subscribers, hopes to be able to take in the Hamilton sale of Short-horns, to be held in Kansas City, on the Wednesday and Thursday of next week.

The College social of last Saturday eve was liberally patronized, and seemingly thoroughly enjoyed by all present. The "barn girls" were there in irresistible force; and the girls and boys from "on the hill" and "down town" came out arrayed in the newest "bib and tucker." The singing was just passable; but the music, and especially the reading and dialogue, were heartily enjoyed and rapturously applauded. When, at ten o'clock sharp, Sup't Graham set his diabolical bells ringing, thereby gently intimating that it was time to go home, the general opinion was that a short but very pleasant evening had been spent.

The November meeting of the Scientific Club was a very enjoyable one. Mr. Leach read the very able address of President Baker, before the American Association for Advance of Science, entitled "Modern Aspects of the Life Question." Mr.

I. D. Graham presented a paper upon the telephone, tracing its growth by successive discoveries. He explained the various telephones now in use. The recently invented photophone was explained, for the first time to some of us. The next meeting of the Club will be on the evening of the first day of December. At this time, papers will be presented by Wm. Ulrich, J. C. Allen, Prof. Walters, and S. C. Mason.

On Monday last, ten Berkshire shoats were set aside for experimental purposes. The chief object of the experiment is to ascertain how much more, if any, it costs to produce a pound of pork when the animals are exposed to all the storms and changes of temperature peculiar to the season, than when they are kept in warm, sheltered pens. To this end, five of the pigs were put in open pens outdoors, and five in warm, comfortable pens in the barn. The pigs are fed twice each day; and all feed is weighed out at each feeding. The temperature in the barn and out-of-doors is also recorded each day; and, on Monday of each week, all the pigs are weighed, and the increase or loss of weight is noted.

The Alpha Beta Society met in Society Hall Friday afternoon. Notwithstanding the change in the weather, a large number were present. Miss Cora Long was initiated. After extemporaneous speaking, a carefully prepared number of the Gleaner was read by the editors. Following this was the usual debate. Next Friday will come the orders of declamation, essay, and select reading. The Gleaner is to be presented in two weeks, by Miss Emma Campbell and Mr. Cotton. The question to be discussed next Friday is, "Resolved, That language is the invention of man." The principal debaters appointed were Messrs. Whaley and Howard, who chose for their assistants Misses Emma Glossop and Gracia Pope. Our Society is steadily increasing in numbers; and much more interest is manifested than we have ever known before. All students are cordially invited to attend. M. E. M.

President Abbot, in his annual report to the State Board of Agriculture of Michigan, the Board of Control of the Michigan Agricultural College, refers to President Fairchild's separation from that institution as follows:—

Another serious loss will be to be deplored at the close of the autumn term, 1879. At that time Mr. George T. Fairchild resigns his professorship of English Literature, to assume the presidency of the Kansas Agricultural College, at Manhattan, Kansas. During the most of the fifteen years of his service in this College, he has taken charge of the instruction in rhetoric and English literature, and in the important departments of political economy and moral philosophy. A considerable portion of the instruction in the French language has been given by him. He was also the librarian of the College; and, under his care, the library has increased not more in the number of volumes than in utility, owing to classification and cataloguing,—all the result of the Professor's skill. He acted as president, in the absence of the president at one time, for a year. The College owes much to his wisdom and co-operation, in its general management. He carries with him the sincere regard and affection of the officers of this institution.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in

each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 p. m. Ladies admitted. New students cordially invited to attend. Wm. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WARREN KNAUS, President.

GEO. F. THOMPSON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations. I. D. GRAHAM, President.

G. H. FAILEYER, Secretary.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering, Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 6, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE.

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE.

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

THE INDUSTRIALIST

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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

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Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Epizooty.

This disease has made its reappearance in this country, and in some localities in an epidemic form, which has become malignant and assumed a dangerous character, both to the animal and its attendants, all of which can be avoided by the timely use of remedies. Those who have suffered the loss of their animals gave no heed to treatment, except nursing, thinking it would not amount to much; but when they saw the blood come from the nostrils then they sounded the alarm, but the thief had already stolen the animal. Treatment given from the first will remove all danger in three days, and secure perfect recovery in ten to fifteen days in 90 per cent of all cases. Apply caustic balsam, one-half ounce, on the throat of the animal and between the jaws, thoroughly rubbed in for ten minutes: one application will be sufficient to check the progress of the disease. Internal treatment is indispensable to aid nature to throw off the poison and eradicate the disease from the system. Ferrum phosphate 3d, one ounce for each animal, dissolved in one pint of soft water; give one-half ounce at a dose three times a day. In severe cases a dose should be given every three hours until the above quantity has been consumed, which will cause the animal to throw off profusely. Then follow with kali mur. 3d, one-half ounce three times a day. If the animal should break out in pustular eruption, cracked heels, scratches, etc., use kali sulph. 3d, instead of kali mur., in the same form, which should be given after the use of ferrum phos., to complete a cure.—Dr. J. W. Johnson, V. S., in Ohio Farmer.

Our Mineral Wealth.

The mineral wealth of the United States, according to some experts, is only in the infancy of its development. During ten years we have progressed from \$17,320,000 in silver and \$22,750,000 in gold, to \$45,146,100 in silver and \$44,880,223 in gold. It is claimed that the next ten years will more than quadruple these figures. During the first seven years from 1870 to 1877, the production of gold exceeded that of silver; but since, the production of silver has run ahead of that of gold \$5,562,595. This is partly owing to the discoveries at Leadville, Col. On the other hand, the great Comstock lode has fallen off in both gold and silver to the amount of \$12,464,481 during 1878-79. The increase of silver production in Colorado during the same time was \$8,000,000. It is estimated that we use \$4,000,000 annually in jewelry and the arts. Last year we imported \$74,400,000 in gold: adding this to the home production, gives an increase of \$106,170,262; still further, adding the silver produced, we have \$143,202,119 of a monetary increase to our wealth. General Brisbin, of the United States Army, who has been through the mining regions of the West during ten years, claims and sincerely believes that 1880 will not pass without giving us an annual production of \$400,000,000 of gold and silver in the United States.—Leavenworth Times.

Blackleg.

To check blackleg in cattle, change the pasture at once. This disease is developed by malaria arising either from low ground or from stagnant water, accompanied with an excess of nutrition; young, thrifty and energetic feeders being the most liable to attack. The change should be to high and dry pasture. If this cannot be done, the herd should be taken to the yard and soiled or fed from the barn. A change of food is essential, and so is plenty of good water and a free use of salt. Something should also be done to change the condition of the blood, which, when blackleg is liable to oc-

cur, is very dark colored, and so thick as to stagnate by a little chilling. The farmer can do this himself by using glauber salts, saltpetre, or iodide of potassium, or, what would be better, using all of them connectively. With one parcel of salt mix as much glauber salts as can be without having the cattle reject the salt,—say 25 per cent. With another parcel mix ten per cent of saltpetre, pulverized. With a third mix iodide of potassium at the rate of four drachms to the pound, and salt the herd alternately with these parcels of prepared salt till the blood assumes its accustomed red color, and the liability to the disease disappears. It will be an important item in the treatment of the herd at this season of the year to protect it from exposure to chilly nights after warm days; and at all times to guard against exposure to sudden changes of temperature and from storms.—Professor L. B. Arnold, in Tribune.

High Prices for Hogs Predicted.

Packers have evidently made up their minds to pay high prices for hogs in November. We hear of several contracts the past week for the delivery of packing grades in the early part of November at \$5 per 100 pounds gross, in this market; and it is understood that, although rather liberal sales have been made at this round figure, the demand has not been satisfied. Last November opened with hogs selling in this market at \$3.50 and \$3.75 for packing grades; and prices varied but little during the first half of the month, but soon afterward advanced to \$3.90@4.15, varying but little from this range until near the close of the month, when they again took an upward course, reaching \$4.50@4.70 the first of December, or an advance of about \$1 per 100 lbs. above the first of November figures, and prices subsequently went 15@20c. higher in the early part of December. In view of these facts, and the present general situation and outlook, we shall not be surprised to see values in November ranging up to \$5 or higher. Whether this figure will make money or not to the manufacturer, is an open question. The records of the arrivals of hogs at seaboard since the 1st of March, show a small increase over the corresponding time last year.—Cincinnati Price Current.

A Glut of Wheat in San Francisco.

The San Francisco Herald says: "Wheat arrives freely, completely filling up all the long and capacious sheds recently erected on the new city front wharves, also the large warehouses long utilized for this purpose. The same remarks will apply to Stockton and other interior points. Sheds a mile long have been erected at different embarcaderos on the line of water-courses and railroads, and yet the cry is for more storage room. Cash advances upon wheat in city warehouses can be obtained at 6@7 per cent per annum, although 8@9 per cent is generally exacted from non-residents. In point of fact, harvesting is not yet completed: a vast amount of grain is yet in the field; and all speed is given to hasten forward the work before the October rains set in. A free arrival of ships suited to the grain-carrying trade of the port, many of which were chartered prior to arrival at or about 60 shillings, and others secured since arrival at 70 shillings or thereabouts, has been the occasion of considerable purchases of wheat for export at \$1.30@1.35 per cbl. for good to choice No. 2 wheat; while millers pay about ten cents more for strictly choice No. 1."

Wichita has an establishment for the manufacture of ornamental designs in fine woods. It is claimed to be the only enterprise of the kind west of Chicago.—Exchange.

Our Exchanges.

The exports of oleomargarine from New York alone, from May 1st to October 13th, 1880, reached the great amount of 4,194,030 pounds, every pound of which was in competition and reduced the price of honest butter.—Grange Bulletin.

The rolling mills are booming at present, night and day, in the manufacture of rails for the Santa Fe and Kansas Pacific roads. The iron is hardly left long enough to cool before it is loaded on flat cars, ready for shipment.—Commonwealth.

Last Saturday, while Messrs. Brown and Sweet were down in the Territory hunting, they came across and murdered one of the largest catamounts we have ever seen. It measured about five feet six inches in length, and weighed about forty pounds.—Caldwell Post.

The charter of the Leavenworth Sugar Company was filed in the office of Secretary Smith to-day. The capital stock of the corporation is \$150,000; and the following directors were appointed for the first year: M. Ryan, M. H. Insley, Lucian Hawley, J. M. Jones and Henry Studwiczka.—Topeka Capital.

Twelve Democrats and twelve Republicans of Salina made a wager on the general result of the election, the losers to provide a banquet for the winning side. In consequence of this arrangement, a fine supper is to come off at Salina to-night, given by the democratic twelve to the republican twelve and their friends.—Topeka Capital.

A car-load of corn, potatoes, wheat, and meat was loaded at the depot in Seneca, on Saturday last, and shipped to Logan, Phillips county, for the relief of Kansas frontier settlers. This relief is gathered under direction of the State Aid Society, and shipped to their care for distribution,—so there is no question but it goes right, and is honestly distributed.—Seneca Courier.

Levi Emple, of Burlingame, says that, if the eastern dog-law can be passed in this State, he will immediately purchase a flock of five hundred sheep. The law referred to taxes every dog in the county; and persons losing sheep by dogs can collect immediately out of this fund. He says the passage of such a law will bring one million sheep to Osage county, with an annual income from them of \$2,000,000.—Osage County Chronicle.

It is a mystery to us why parties owning residences in the city do not try to make them home-like by planting out trees. The farmers could also improve the general appearance of their homes in the same way. Tree-planting has a peculiar charm about it that is infectious. Nothing so strongly attaches to country life and local habitation as to witness the gradual growing and extending of a forest of healthy trees.—Logan Enterprise.

Cane and Grape Sugar.

Prof. Kedzie gives the following valuable bit of domestic information: "Cane sugar is two and one-half times as sweet as grape sugar, closely allied to it, and differs so little from it that some persons cannot distinguish it. By cooking, the cane sugar may be changed to grape sugar, and thus lose its sweetening power. Some women put the sugar in with a mass of acid fruit to be cooked; and keep cooking and adding sugar, while it keeps on growing sourer, until at last they use two and one-half times as much sugar as they need to secure the desired result. The cane sugar has been changed to grape sugar. Now, if the sugar had been added after the fruit was cooked, much less would have been required, and the result would have been far more satisfactory."

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 13, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

American Architecture.

With every nation, architecture has been the beginning of art. The prosperity of our art schools depends upon that of architecture; and, if this languishes and fails in the present century, the next one will not bring us painting, sculpturing, and true taste in applied art. An appreciation of fine art cannot be manufactured out of pottery, nor out of printed stuffs; we cannot reason it out by philosophy; fancies will not create it, nor experiments; if we are ever going to have it as a nation, we must build it out of stone, brick and timber.

Our buildings are true pictures of our nation, which is a conglomerate of all principal nations and tribes on earth. Looming up grandly, exhibiting many points of excellence,—inventiveness, boldness in execution and practical sense,—they are lacking in character. It seems as if each emigrant had brought with him fragments of the architecture of his country; and these had been thrown together and mixed, producing an original American style,—a perfect abracadabra. There is no character anywhere. Round arches, segment arches, Gothic arches, and Greek cap-stones, are found in the most fantastic disorder. Greek columns ornament Gothic gable-fronts, and Norman towers show renaissance cornices and domes, with Moorish archways and windows below. What will be the result of such a practice? There can be no doubt: it will be a general disgust ultimately, and then a change. We must and will learn to value style and character in our buildings. We must and will begin to imitate closer, making changes with more care as they become necessary; creating thus, ultimately, an American Gothic, an American renaissance, an American Moorish, and an American Greek style, (bearing, of course, other names). And this will be the beginning of art on this continent. Climatic changes influence, if they do not dictate, the principal forms of architecture. In a country like the United States, whose territory touches upon arctic cold and tropic heat, whose limits embrace every condition of atmosphere, it would be too much to expect a distinctive style of architecture. In Louisiana, the long summer seasons, the hot sun with its glaring light, call for wide porticoes, broad piazzas, open passage ways, so as to let in the air and moderate the heat. In Minnesota, the short summer, the arctic winter, the heavy fall of snow, demand compactly built houses with steep roofs, houses that retain the heat of the stoves, keep out the winds, and shed the snow. But, while we may not look for an American style of architecture as a solution of the art problem named, we must strive to secure more obedience to the laws of substantial construction, and, above all, more obedience to the laws of harmony.

—Prof. Walters.

The Meter.

It is now quite certain that the next Congress will adopt the metric system as the only legal one for all government transactions, except the deep-sea soundings, for which the English unit, "fathom," will be retained. The matter is in the very best shape. The committee on weights and measures has already prepared its recommendation of the meter; and the next Congress, expected to be less disturbed than the last, which postponed the matter, will take it up, beyond doubt. The recommendation of

the committee has been printed; and 10,000 extra copies have been distributed among the most interested citizens of the country. The report gives a history of the meter and its progress among the civilized nations of the world; an explanation of its relation to the various measuring units; a synopsis of the work of the international commission on weights and measures; the reports of the different government offices, as to the expenses which a change of the present system to the metric system would involve; and, above all, the arguments of several authorities on weights and measures in favor of its adoption. These arguments are not only interesting, but they are solid and overwhelming. They must tell with every intelligent man; and, since our present systemless system must be doctored sometime, we hope and know that our next Congress will hesitate no longer.

That the people of the United States are willing to adopt the system at once, appears from the petitions that are showering upon the committee and the members of Congress. Among those received by the committee, is one from the mayor and city council of Baltimore, one from the National Academy of Science, one from the American Meteorological Society, one from the American Society of Civil Engineers, and a storm of petitions from almost every leading college in the land.

The reports of the governmental departments show that the expense of changing the present system would not be very heavy. The Army Department reports no extra expense, the Postal Department asks for less than \$150,000 to make the change, and other departments report small expenses only. They all claim, however, that the people of the United States should in this case, voluntarily or forced, make the change too; and that therefore the new system should go slow.

As expected, the Department of Public Lands seems to be quite puzzled about the adjustment of the meter to the present system of land surveys,—the square mile and quarter-section. It says: "The practical advantages of the present system should not be hastily resigned. If the hectare of the metric system should be adopted as the unit, instead of the acre, the most convenient and suitable practice would be to provide that the new section of land should consist of 256 hectares, and be a square parcel of land measuring 1,600 meters each way. The sides of this square would measure 5,249 feet and a fraction of inches, or 30 feet and 7 inches less than one mile." This "new section" would be smaller than the old one by 7.4 acres only.

That this would result, in some measure, in bringing disturbance into our present system of land surveys and records, must be conceded; but the trouble would be less than anticipated. The present system, too, has grown by steps and changes; and, furthermore,—and this seems to dispose of the whole subject,—the public land surveys have been conducted with such reckless carelessness that there is, according to the statement of authorities in geodesy, not a single section-line in the whole West exactly where it should be. A difference of one-fourth of 7.4 acres per quarter-section, would be an unimportant one.

But no roses without thorns. Congress will not ignore the claims of an advancing civilization for such trifling reasons; but will abolish a system of measurements that comprises 127 units, invented for the purpose of separating the subjects of one landlord from those of another, ridiculed by the rest of the world, and the worst that ever existed. A Congress that knew that the way to resume was to resume, will see that the way to get the meter will be to get it.—Prof. Walters.

Bread-making.

It is well understood that the preparation of bread, as an important article of food, dates back to a very early period. Away back in Genesis, we find undoubted instances of its use. Bread made of fine flour, however,—such as we are accustomed to use on our tables daily,—was used in the early times only by the wealthy, and for sacrificial purposes, barley cakes being the everyday bread of the poor people.

The Anglo-Saxon bread or *breod*, the German *brod*, the Dutch *brood*, the Dane and Sweed *brod*, was made in ancient times as follows: The sifted flower was mixed with milk or water to a stiff dough: then followed a thorough kneading,—in Palestine with the hands, in Egypt with the feet (the latter being much the easier method), in a regular kneading-trough hewn out of hard wood. When this process was completed, the leaven or yeast was added, causing another season of faithful kneading. Then they allowed their well-worked dough to stand until it had risen, after which they made it into round loaves and baked in stationary ovens. They carried it to these ovens on their heads; so we conclude that they mixed it with the feet for ease, carried it on the head for convenience, bathed the crust in saliva to make it shine, and at last took it into their hungry stomachs as dainty food. A poorer class of people, who were of migratory habits, baked their bread in quite a different style, laying it between hot stones; or, when they were in a great hurry, threw it into the ashes, rolled a few embers on, and rushed it through. Our modern way of making bread, while there may be some points of similarity, in the main, is widely different.

First, I would say that the importance of healthful bread must not be overlooked. If bread, *brod*, *brood*, or *brod* is really the staff of life, and is certainly the most important of all the endless variety of our daily nutriment,—for, while we can leave off from our tables any one of the other dishes, we can in no case leave off bread,—then we should be exceedingly careful that we bring it before our families in a pleasing and wholesome condition. Sour bread makes sour stomachs, sour faces, sour dispositions, sour husbands, sour children, sour homes. Alas, what a state of ferment, all because you used sour yeast, or did not bake your bread at the proper time. I acknowledge that poor, unwholesome, unsatisfactory bread will appear sometimes; but this need not be the rule, but rather let it be the rare exception. A piece of good bread taken into the stomach makes but one revolution around that stomach, while bad bread passes around three times before it is admitted into the large intestines. Detention of digestion subjects us to disease, especially children, who are often thrown into slight fevers which by most mothers are unaccounted for; and, worse than that, their organs are permanently injured or prematurely worn out with grinding up bullets of bread. Furthermore, you can never teach your children any table manners, which I consider the most important of all manners, if you are in the habit of placing poor bread before them; for where is the mother who could successfully criticize her child for bad actions when she was conscious that she was herself constantly provoking him to those bad actions. Good bread brings happiness, also. Nothing makes the heart of a cheerful, loving wife lighter or happier at meal-time than to hear her husband say, as he butters his second slice of pure, white, spongy bread, "Wife this is equal to my mother's." Surely this satisfies the most jealous wife; and I would remark further that every wife

ought so to prepare her bread that she will be certain of just this compliment from her well-bred husband.

Every housekeeper should be able to test flour and select a good quality for bread-making; because we so often hear ladies remark that they do not know what ails their bread, when, if they had examined understandingly, they might have found the first cause in the flour. Every one ought to know just how to make lively yeast, and not depend so much on the patent yeasts that have their day and run out. Let it be fixed in the mind of every lady, that there is no yeast like old-fashioned, home-made, dry, hop yeast, that our mothers made, and handed down the way to make, through many generations.

It is conceded by the best bread-makers that yeast made with potatoes has no equal; though many persons make excellent bread with sour milk or buttermilk, scalding it thoroughly first, then scalding their flour with the same for the setting of sponge. It requires a deal of strength to knead it sufficiently; for the more vigorous the handling of dough, the finer the perforations in the bread. Not a little depends on the baking: this cannot be done by rule, but by practice and Yankee gumption. So many things have to be taken into consideration that nothing can be done by rule, weight or measure. The size of the loaves, the kind of wood for fire, the kind of pan you bake in, the size of the oven you use,—these and many others things must be thought of. After your bread is baked, too much care cannot be taken in the cooling process. It is one of those things that imbibes odors or impurities very readily, and therefore should be placed in a very pure spot to cool.—Mrs. J. S. Platt.

Educational Gossip.

Newton has a scientific society.

Topeka is going to have a "Town and Home Improvement Association."

The editor of the Belle Plain (Sumner county) News has established a circulating library.

The foundation for the new school-house in Wellsville is nearly completed; and the building will be in the hands of the carpenters soon. It is something the town has needed for some time.

In the report of the county superintendent of Marshall county, we read: "The number of weeks school has been in session last year is 3,475, equivalent to 68 years." This statement is very interesting; for it explains, also, why the "marms" get old so fast.

The last meeting of the Arkansas Valley Editorial Association does not appear to have been a success. The process of dividing and subdividing the State Association will hardly work to advantage. It would be better to keep up the old society, which has furnished so much fun for the boys for the last fifteen years.—Champion.

Literary societies, debating clubs, lyceums, and the like, have been started at the rate of one an hour for the last week, all over the State. If well conducted, such institutions do a great deal of good for young people. To make them a success, however, there must be order at the meetings, tact in the selection of the subjects for debate, and hard work done on the part of the principal speakers. Good debates require preparation at home. As a rule, there is, in such societies, too much extemporaneous, wishy-washy talk.

From the report of the meetings of the Kansas Academy of Science, we glean that the problem of science teaching received a good deal of attention there. President Fairchild, of the State Agricultural College, lectured on "Science in Every-day Life;" Prof. Davis, of Emporia, read a paper on "Progress and Importance of Science in our Common Schools;" Hon. Judge Adams spoke on "Science Teaching in Common Schools;" and Prof. Lovewell, of Washburn College, lectured on "Science in Schools."

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 13, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

The second examination of students for this term will be held next Friday.

Threshing was finished on the farm, Saturday last. A light yield of wheat and oats is reported.

Deep snows are reported both in Colorado and east of the Missouri. A nice country that, to live in!

Mr. Frank Kedzie, brother of our late Prof. Kedzie, is the guest of President Fairchild, this week.

We are under obligations to some friend for a copy of the report of the Michigan State Board of Agriculture for 1879.

Prof. A. J. Cook, the well-known Professor of Entomology of the Michigan State Agricultural College, is, with his family, visiting at President Fairchild's.

President Fairchild, Profs. Failyer and Popenoe, and Sup't Graham, are attending the Topeka meeting of the Academy of Science. All are expected back to-day.

Prof. Smythe, of Andover Theological Seminary, spent most of Monday morning looking through the different departments of the College. The Professor expressed himself as much pleased with his visit.

The *Prairie Farmer* comes to us this week in an entirely new dress, and looking as neat as a new hat just out of a band-box. The *Prairie Farmer* is one of the best and ablest agricultural and family journals published.

The new shed on the north side of the hitching grounds, at the rear of the Mechanical Building, protecting as it does a large part of the hitching yard from the north wind, is of great service to others than the owners of the shed.

From the *Burlington Patriot*, we learn that Mr. C. A. Dow and Miss Alice D. Conrad were united in marriage, Oct. 23d, Judge Kingsbury officiating. These young people have the best wishes of the INDUSTRIALIST and many College friends of Mr. Dow.

We are "jam full" of students this term; but, judging from the old students who say they are coming back and who have seen others who say or have written that they are coming next term,—to say nothing of new students,—we shall slop over a good deal before the year is out.

Mrs. Platt's article on "Bread-making" is, we believe, an abstract of a paper read by her before the "Domestic Science Club," at its meeting of two weeks ago. Of this paper we have heard much commendation, by ladies who think that they know how to make good bread.

Every farmer ought to take *Colman's Rural World*. The price has been reduced to only one dollar a year, making it the cheapest and best weekly agricultural paper in the country. Fine premiums are also given for clubs. Send for free sample copy to Norman J. Colman, Publisher, St. Louis, Mo.

If our big brother of the *Nationalist* does not cease his references to the "Mayday Gleaner and INDUSTRIALIST," there will be found, one of these frosty mornings, in the near neighborhood of the *Nationalist* office, the dearest, coldest, and most unsavory corpse ever seen in these parts. We should do our duty in this matter at once were we not assured that Bro. Griffin, in his excessive modesty, really means *Nationalist* when he says *Mayday Gleaner*; and then he knows, and everybody else, that the last name means just as much.

The quarterly report of the Kansas State Board of Agriculture, for the quarter ending September 30th, 1880, is received. This report is a rather bulky volume of 154 pages; but, considering its contents, few will complain of its size. The strong point of this report is its very complete chapter on "The breeding, management, and grazing of cattle in Kansas" which occupies 107 pages of the report, and which is the most complete of anything of the kind before written or compiled in the State. This report will be found very valuable to the old resident as well as immigrant, all of whom may obtain it, as long as the edition lasts, by sending five cents to pay for postage, to Major J. K. Hudson, Topeka, Kansas.

Prof. Cook, in the course of a thoughtful speech made in chapel yesterday morning, let fall certain suggestions which the INDUSTRIALIST wishes to emphasize and to give a wider hearing than a speech in chapel ordinarily receives. The Professor, after speaking of the very intimate and cordial relation existing between the Michigan Agricultural College and our own, gave some excellent advice, which every student might apply to great advantage. He counseled every student to make the most of his opportunities; especially, we should go to the bottom of every subject touched on, and be resolved to appropriate it. The curse of the age is superficiality; and this evil is being felt in all the walks of society. The speaker also urged that every student determine at once to "go through,"—take the whole course as laid down in the curriculum,—and not be content with one or two terms, or even years, of study. The Professor said that he had met many who had taken these partial courses of study, who had assured him that leaving the college had been the mistake of their lives.

The Alpha Beta Society met at a very late hour in Society Hall. The bell was not rung; and, consequently, the classes in rhetoricals were not dismissed at the time they should have been. Society was called to order by the President. Devotion by Mr. Copley. Miss Lamer was initiated. The usual interest was taken in extemporaneous speaking. On account of the lateness of the hour, the order of debate was passed. The committee reported the arrival of our pictures, which are for the adorning of the bare walls of Society Hall. The duties assigned for two weeks were: declamation, E. M. Platt; essay, Carrie O'Meara; select reading, Miss Thrasher. Next Friday the *Gleaner* will be presented by the editors, whose names have already been given. Debate next will be conducted by Messrs. Swingley, Barrett, Clark and Hutto. The question to be discussed is, "Resolved, That the printing-press has done more for mankind than any other art." We were twice favored with fine selections by the music committee. We still urge new students to visit our Society; and we will try to entertain you. M. E. M.

SOCIETY HALL, Nov. 6th, 1880.

The Webster Society met at the usual hour. The following officers were elected for the remainder of the term: President, Geo. F. Thompson; Secretary, S. C. Mason; Corresponding Secretary, J. C. Allen; Treasurer, M. A. Reeve; Librarian, S. N. Peck; Marshal, Warren Knaus. An interesting debate followed, upon the question, "Resolved, That a man will do more from pride than from necessity." Speakers upon the affirmative, Messrs. Horning and Reeve; upon the negative, Messrs. Palmer and Myers. The affirmative argued that all the wealth a man gathers about him, beyond what is actually needful for life, is the result of pride; while the negative took the ground that, as man advances to higher stages of civilization, increased comfort and refinement of surroundings become to him necessities. The decision of the judges was for the affirmative. The *Reporter*, presented by M. H. Markum, was instructive and spicy, as usual. A vote of thanks was tendered to S. M. Fox for the gift of a fine engraving of Daniel Webster. The question chosen for the next debate is, "Resolved, That socialism and communism tend to the demoralization of society." Visitors always receive a cordial, Webster welcome. SCRATCH-PAPER.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or

Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books,

under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M. & A. B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. WM. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

GEO. F. THOMPSON, President.

S. C. MASON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations. I. D. GRAHAM, President.

G. H. FAILYER, Secretary.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry. Photography and Household Chemistry.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering, Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 13, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope. The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blowpipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department. Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING OFFICE.

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE.

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

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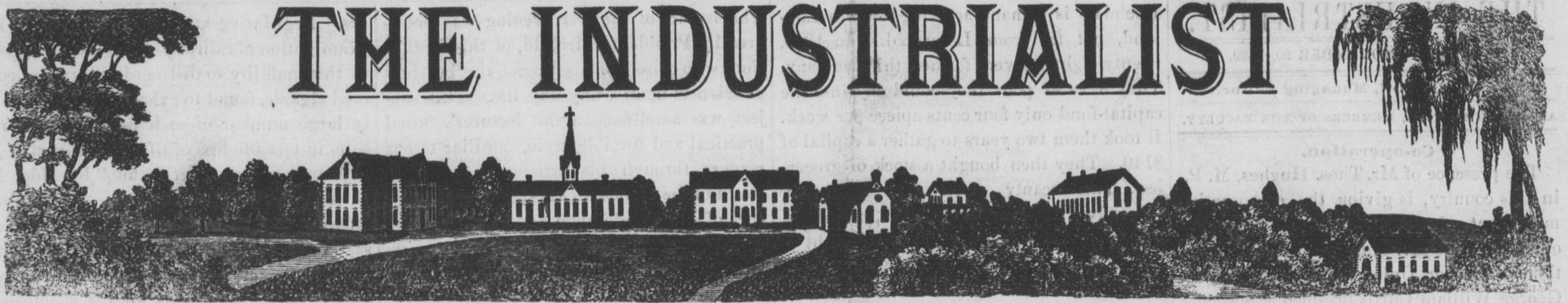
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VOL. VI.

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The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

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Relation of Education to Industry.

It is observed that there is a growing disinclination among our youth to obtain a living by manual labor; and this result is boldly charged to the public school. The recent financial check to the prosperity of the country, resulting in much idleness, has afforded aristocracy a coveted opportunity for a renewal of its assaults on popular education. The now ridiculous complaint of Bacon against the schools of the seventeenth century, that they filled "the realm full of indigent, idle and wanton people," is applied to public education in the United States; and the schools are assailed as the enemy of industry and labor.

It is conceded that the schools may not be doing their full duty in inculcating a respect for labor, and in giving youth a general preparation for industrial pursuits; but we claim that they are not responsible for the evils which afflict American industry. It is a common trick of logic to connect two contemporaneous phenomena as cause and effect. The moon is thus held responsible for many results in agriculture. It is certainly illogical, as well as unfair, to charge the schools with results which are clearly due to other causes. The present disinclination to manual labor is largely due to social causes, including (1) the once degrading influence of slavery, with its "mud-sill" theory of labor; (2) immigration, which has filled the country with caste ideas and resulting social customs; (3) the growth of aristocratic ideas, due largely to shoddy wealth; and (4) the antagonism between the ideas of civil equality and social caste. Another influence is the rapid growth of our American cities and towns, creating new and varied industries, opening numerous positions requiring intelligence, and over-bidding the farm and the shop. But the most of the idleness which disgraces our industrial life is due to *inborn laziness*! A disinclination to work is no new thing under the sun. It is as old as human nature; and the lower the intelligence and moral condition of a people, the less their relish for manual labor. Intemperance and other vices are fearful recruiters for the army of idlers and tramps.

These and other causes which might be named are sufficient to account for the unsatisfactory condition of American industry. Schooling may spoil some people; but many more are spoiled for the lack of it. It is ignorance, not intelligence, that is degrading American labor and crippling American industry. The most effective agency in the industrial progress of the country is the public school.

Over against the assertions and dogmas of aristocracy, we put the following propositions, abundantly sustaining them by an appeal to experience:—

1. *Education promotes industry and lessens idleness.* It awakens and multiplies desires, and thus incites effort to secure the means of their gratification. The awakened soul has wants as well as the body. Education thus touches both factors in the great law of wealth. It creates demands, and it also incites to effort for their gratification. Ignorance everywhere clothes itself in rags and lives in hovels; but intelligence changes the rude hut to the cottage. It awakens desires, intensifies human effort, and multiplies and varies the forms of industry. Wealth is the child of education.

2. *Education makes labor more skillful and more productive.* This proposition is based on a wide comparison of intelligent and ignorant labor, and is sustained by such a multitude of observations that it is no longer questioned by any one familiar with the facts. In all pursuits, skill depends largely on intelligent power,—quick perception, ready reasoning, prompt decision, and good

judgment. The mechanical arts demand intellectual as well muscular accuracy. In proof, we cite the inquiry of Horace Mann in 1864, and of Commissioner Eaton in 1870; also, the lessons taught by the Great World's Expositions,—London in 1851, Paris in 1867, and those subsequently held. The universal and undisputed testimony is that intelligence gives skill to the hand. The day of mere muscle in industry is passed, and the day of mind has dawned. Every form of industry demands the ingenious brain and the cunning fingers of educated labor.

3. *Education improves the condition of the laborer.* It increases his economy and thrift, lessens his tendency to fall into vice and crime, gives him greater social and moral influence, and prepares him for wiser discharge of all civil duties. These positions are sustained Mr. Mann's investigations, by the testimony of Mr. Mundella, M. P., a great manufacturer in the Sheffield district, Eng., and many other competent witnesses. Mr. Mann found that those who otherwise "would be condemned to perpetual inferiority of condition, and subject to all the evils of want and poverty, rise to competence and independence by the uplifting power of education." The workman is more than a machine. He is often the head and guide of a family, a member of society, a citizen of the State; and out of these relations flow duties of the highest importance. To prepare the laborer to meet the higher obligations of manhood, is the highest function of education.—E. E. White, L.L.D., in *Educationist*.

Will Education Yield Subsistence?

An education, yes; but what sort of an education? A bricklayer's education, an artisan's, a farmer's, would indeed help him to earn a living. A college education would give him a social advantage; but it would not, in itself, increase his chance of earning a living: it would rather diminish it. For, as was pointed out in an interesting paper lately published in this magazine, our colleges do not, like the French and German universities, instruct a young man in the bread-winning pursuits: the American colleges are, on the contrary, institutions for general culture. I do not take up the question here of the amount and value of the culture they supply. The point for us to note is that the educated young American who has not a special education as a breadwinner, is worse off, as to his money prospects, than the young American who has no college education at all. Dig he cannot, and to beg he is ashamed. Two of the professions, at least, are fatally overcrowded. The United States, with a population not greatly larger than that of the German Empire, graduates every year five times as many physicians; for the German Empire limits the number of its doctors, and we do not that of ours. Very many of our physicians not only wait years for practice, but never get into practice at all. It is much the same with the profession of law. In both professions there are prizes for a few, and failures, more or less complete, for the many. The engineering, mining, and other scientific professions, offer a somewhat better chance; and public life, almost neglected as a profession, will attract a better class of young men from year to year. But upon none of these, save in favored and exceptional cases, as where a son succeeds to his father's practice, can a young man depend for fortune, or even for immediate support. They, too, offer a certain social dignity. But, as a rule, it is the artisan, or tradesman, that has the better chance of supporting himself: it is the educated man that has, more frequently, to wait before he can pay his way. If, therefore, we educate

sons, it is all the better reason why we should provide, not indeed for their independence, but some aid during the years which they are likely to spend in waiting before they can achieve their position.

It is to be remembered, too, that these years of waiting may be become, with such aid, years of scholarly or scientific accomplishment, if not of money-making; years of strengthened preparation; years that might introduce and brighten a career, instead of wasted years that cloud or spoil it.—T. M. Coan, in *Harper's Magazine* for November.

Our Exchanges.

The *Jewell County Monitor* says there is in circulation, in the counties west of that place, counterfeit silver dollars, which almost defy the skill of experts. The bank of Kirwin received quite a number before they detected them.

The Governor yesterday appointed Hon. Joel Holt, of Beloit, a regent of the State University, in place of Rev. F. T. Ingalls, of Atchison, resigned. Mr. Ingalls will spend several months in Europe.—*Commonwealth*.

Dry bedding and a good wind-break for stock, during the fall and winter weather, is one of the most profitable investments stock owners can make. Take care of your animals: aside from the humanitarian view, it pays.—*Emporia News*.

There will no doubt be a good many strong words used in the county treasurer's office this year, from city tax-payers. Water-works and new school-houses will not look quite so attractive when viewed from that standpoint: they will seem to be under a shadow, so to speak, about that time.—*Emporia Journal*.

Mention was made some weeks ago of the selection of Fort Lyon as a point for sinking one of the artesian wells provided for by Congress. We are now able to report some progress toward the enterprise. Mr. Chalkley Griscom, of Pennsylvania, has been made superintendent of the work; and is collecting the machinery and implements to be used in the work. The spot selected for the hole-in-the-ground is about one and a half miles north of Fort Lyon, and two and a half miles from the Las Animas railway station. Two steam-engines, a diamond drill, and a considerable lot of iron pipe, picks, and shovels, are now at the railway station; and a derrick is in course of construction at Pueblo. About four men will be employed at the well. W. B. LeDuc, son of the commissioner of agriculture, is connected with the outfit in the capacity of clerk.—*Dodge City Times*.

One night often destroys the whole life. The leakage of the night keeps the day forever empty. Night is sin's harvest time. More sin and crime are committed in one night than all the days of the week. This is more emphatically true of the city than of the country. The street-lamps, like a file of soldiers with torch in hand, stretch away in long lines on either sidewalk; the gay-colored transparencies are ablaze with attractions; the saloon and billiard halls are enchantment; the gay company begin to gather at the haunts and houses of pleasure; the gambling dens are aflame with palatial splendor; the theaters are wide open; the mills of destruction are grinding health, honor, happiness, hope, out of thousands of lives. The city under gaslight is not the same as under God's sunlight. The allurements and perils and pitfalls of night are a hundred-fold deeper, darker, and more destructive. Night life in our city is a dark problem, whose depths and abysses and whirlpools make us start back in horror. All night long, tears are falling, blood is streaming.—*Cowley County Telegram*.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 20, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Co-operation.

The presence of Mr. Thos. Hughes, M. P., in this country, is giving the co-operative movement a fresh start. The friends of co-operation gave Mr. Hughes a public reception, at Cooper Union, on November 5th. George William Curtis presided. Speeches were made by Mr. Curtis, Robt. Collyer, and others. Mr. Hughes, in an able address, showed what co-operation is doing for the working classes in England; and urged the importance of its general adoption in this country. From his address as published, we collate a few facts.

Since 1852, in England and Scotland, 1,200 co-operative societies have been organized, with an aggregate membership of 500,000. In 1877, the capital invested was about \$240,000,000; and the profits for that year were about \$7,000,000. These profits were distributed among the members, in proportion to the amount of goods purchased by the individuals. Without co-operation, these millions would have been divided among a few hundred dealers, giving several thousands to each. Most of those smaller societies are combined into a wholesale society, by means of which all alike get the advantage of wholesale rates in purchasing.

Co-operative societies are rapidly increasing in England. Many are being established in this country. As we stated in a former article in this paper, we believe that co-operation is the solution of some of the perplexing problems of the present time. The trade spirit—the spirit which overrides everything for the sake of gain—can only be tamed by the spirit of Christianity. The golden rule must be recognized in the marts of trade. Co-operation, or the sharing of the profits by all those who contribute to make the profits, is a practical recognition of the divine precept, "Do unto others as ye would that others should do unto you."

In regard to the results of co-operation in England, Mr. Hughes says:—

"In all those co-operative societies, these fundamental principles have been publicly accepted: that every article shall be sold precisely for what it is; that no sort of adulteration shall be tolerated; that all dealings shall be for ready money. The beneficent effect of these rules has been felt wherever the societies have established themselves. The credit system, which weighed with such terrible pressure upon the poor, has disappeared. They have obtained pure articles of consumption for less money; and, what is of more importance, the character of the members has been raised, by the industrial education which has resulted from the management of such associations. The members have learned to understand and appreciate the conditions of industrial success, the teachings of economic science, and the real possibilities of trade. It has been a practical training which has dispelled, to a great extent, vague theories by experience; and in the future, even more than in the past, the tendency is to produce harmony between employers and working people, by revealing to the latter some of the necessities and difficulties which beset the former, and affording them means of ascertaining the real conditions of trade and the prospects of the markets. Above all, the movement has infused hope into lives which before were weighed down by conditions that seemed to hang over them like a malignant fate, and against which it was scarcely possible to contend with any hope of success."

These statements, strong as they are, may be considered authoritative. The evidence in regard to the beneficent results of co-operation is cumulative. The history of the wonderful success of the Equitable Pioneer Society of Rochdale, reads like a romance.

Rochdale is a manufacturing town in England, not far from Liverpool. In 1842, twenty-eight weavers formed this company. They were so poor they could pay into the capital-fund only four cents apiece per week. It took them two years to gather a capital of \$140. They then bought a stock of groceries. This scanty stock was soon sold, themselves being the purchasers, at the usual market rates. Its proceeds bought a larger stock. This was sold, and the next, and the next, and so on. In 1845, their capital-fund had increased to \$910. This continued to accumulate; so that, in 1852, they opened a wholesale department. All kinds of stores were established in the town, by the Society. In time, mills were built and operated by those who owned them. In brief, from the insignificant beginning in 1842, the Society had so increased that, in 1877, its members numbered 8,800, most of them working men: its capital in round numbers was \$1,200,000, and its sales for that year were about \$1,750,000. This enormous business is annually increasing, and is still controlled by men who work for daily or weekly wages. But, read between the lines, these figures show vastly more than an array of capital and business. They show that the social and intellectual improvement of those Rochdale artisans has correspondingly advanced. Schools have been established and maintained, reading-rooms opened, large libraries gathered, scientific lectures patronized; in short, society has become imbued with the spirit of progress.

The changed condition of the people is well told by Mr. Holyoke, in the following extract from his "History of Co-operation in Rochdale":—

"These crowds of humble workingmen, who never knew before when they put good food in their mouths, whose every dinner was adulterated, whose shoes let in the water a month too soon, whose new coat shown with 'devil's dust,' and whose wives wore calicoes that would not wash, now buy in the markets like millionaires; and, as far as pureness of food goes, live like lords. They are weaving their own stuffs, making their own shoes, sewing their own garments, grinding their own corn. They buy the purest sugar and the best tea, and grind their own coffee. They slaughter their own cattle; and the finest beasts of the land waddle down the streets of Rochdale for the consumption of flannel-weavers and cobblers.

The teetotalers of Rochdale acknowledge that the Store has made more sober men since it commenced than all their efforts have been able to make in the same time. Husbands who never knew what it was to be out of debt, and poor wives who during forty years never had sixpence uncondemned in their pockets, now possess little stores of money, sufficient to build them cottages, and go every week into their own market, with money jingling in their pockets. And in that market there is no distrust and no deception: there is no adulteration and no second prices. The whole atmosphere is honest."—Prof. Ward.

The Recent Meeting of the Kansas Academy of Science.

The thirteenth annual session of the Kansas Academy of Science, held last week, in Topeka, is considered by the members to have been one of the most successful and interesting held by this Society. The attendance of members and visitors, both from Topeka and abroad, was large,—fully up to the average. The number of new names added to the roll of members, exceeds the additions of several years previous; and, judging by these facts and by the character and number of the papers presented at the meeting, we believe that the usefulness of the work of the Academy is becoming more generally recognized.

The evening sessions were, as usual, occupied by the presentation of popular lectures upon some phase of scientific thought.

The lecture of the first evening was delivered by President Fairchild, of this Institution, who chose for his theme, the bearings of science upon every-day life. This subject was amplified in the lecturer's usual practical and forcible style, familiar to our readers through his articles in previous issues of the INDUSTRIALIST. The dependence of the people upon applied science for the gratification of many tastes, for comfort, health, and oftentimes for existence, was made evident to all his hearers. He considered it a very narrow view that looked upon science as the servant of mankind, and preferred to consider it the daily companion, or rather even the leader, of the people; comparing it, also, to a mental sunshine, pervading everything yet sometimes scarcely recognized as one of the chief causes of the present state of culture. He adverted further to the manifold applications of the principles and generalizations of students of pure science to the various arts, especially to agriculture and horticulture: referring to the work of the agricultural chemist in studying soils, plant elements and fertilizers; of the botanist in his experiments on cross-fertilization and seed selection, and investigation into the fungoid diseases of plants; of the entomologist in his observations on the habits of parasitic and injurious insects; and of the student of zoology, whose deductions are susceptible of the most valuable practical applications in stock-breeding. These, and the many other relations between pure science and applied science or art, were fully discussed in the lecture.

The number of papers announced in the programme was thirty-seven. With a few exceptions, these were duly presented and discussed, often at considerable length. Space will allow notice of a few only, of general interest.

Dr. S. W. Williston's paper upon the "North American Species of *Conops*," described several new species, and presented a new arrangement of those already known to belong to this interesting genus of flies, which are parasitic upon various *Hymenoptera*, inhabiting bumble-bees, wasps, hornets, and other wild bees.

The list of Kansas reptiles, presented by F. W. Cragin, is a very successful attempt to put in compact and permanent form our present knowledge of the distribution of the members of this interesting branch of the fauna of our State. The total number of accredited species and well-marked varieties is 87: this number includes five poisonous serpents,—the copperhead, massasauga, and the Edwards', Missouri, and banded rattlesnakes. Of this number, not more than two species are common,—the copperhead and Missouri rattlesnake.

Hon. D. B. Long described the modes of working in vogue among fish-breeders; and called attention to the availability of the German carp for stocking Kansas waters, speaking in high terms of the prolific and hardy character of this excellent fish. Curious and valuable hybrids between some of our common food-fishes were described.

The Kansas Weather Service, its objects, needs, and the results of its work, were presented by Professor Lovewell, of Washburn College. Although this service has only fairly begun its work, results of value have already been developed. Facilities for enlarging the scope and usefulness of the service are greatly needed.

Dr. John Fee, of Kansas City, presented a carefully prepared discussion of color-blindness and the various theories proposed to account for the peculiarities of the phenomena exhibited by the color-blind. The paper was illustrated by a series of test col-

ors. Legislative action in reference to an examination of railroad employes was urged; as the inability to distinguish between colored signals, found to exist in a comparatively large number of such persons, often results in terrible loss of life and property.

A paper upon "Irrigation," by Hon. F. G. Adams, detailed the recent encouraging attempts to reclaim portions of the Arkansas Valley to profitable agriculture, and presented facts from various authoritative sources to serve as basis for his conclusion that the measure of success already attained called for a careful survey of the river valleys of our western plains, considerable areas of which might become the seat of an important agricultural interest.

A paper of kindred interest was read by Mr. H. R. Hilton, upon rainfall in its relations to Kansas farming. The author considered the character of the soils of Kansas in reference to their relative capability of absorbing and retaining moisture, and in connection with the average rainfall. He held that it was not the actual amount of rain which falls in a given district that is a measure of the ability of that district to withstand drought, but the amount absorbed by its soil and stored for plants. He claims also that, of the winds from the Gulf, which form the chief source of moisture to the States of the Mississippi Valley, those that blow across Kansas are as humid as those that reach the States farther east; and that our rainfall is less than theirs, simply because we offer less favorable conditions for precipitation. These conditions are deeply plowed and well-cultivated fields, growing crops, larger areas of trees, ponds of water, and ranker vegetation of all kinds; and the writer adduced, in support of the theory, the great change brought about by cultivation in the eastern portions of our State since its settlement. To increase our rainfall, we must reduce radiation and increase evaporation; thus producing the conditions favorable to a condensation of the moisture in the overlying strata of air. The main point presented was that the cultivable area of Kansas is increasing and will increase with the advance of settlement; as more favorable conditions for the precipitation and retention of moisture are brought about by cultivation. The remaining papers on the programme were largely technical and descriptive. Most of them formed important contributions to our knowledge of the resources of our State in archaeology, geology, botany, and zoology; and will be printed in the forthcoming volume of "Transactions" of the Academy.

The lecture on the second evening session was given by Prof. Lovewell, upon "Science in Schools." This lecture was an examination into the progress of scientific teaching here and elsewhere, with hints for making existing modes more valuable. The lecture was followed by a popular description of the ruins of the city of Pecos, by Col. T. S. Case, of Kansas City. Both speakers gained the hearty applause and appreciation of the audience.

The local interest in the proceedings of the Society, exceeded that displayed in the previous meetings held in Topeka; and should be regarded as evidence of the increasing popularity of the Academy and its work. The large number of papers with an economic bias is also a feature to be noted with commendation. Taking everything into consideration, we believe the Academy to be on a better footing at the present time than at any preceding time in its history.—Prof. Popenoe.

OVER one hundred students are in attendance at the Fort Scott Normal School.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 20, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Hon. Jno. A. Anderson this week contributes six volumes of Congressional Records and United States Statutes to the library.

The Anthony Journal has reduced its size one column to the page, the space formerly occupied by land notices. But, big or small, the Journal is a good paper.

The public exercises of yesterday consisted of original orations by Messrs. Lightfoot and Houston, and Misses Adams, Mason, and Glossop,—a division of the Senior Class.

Miss Annie Pillsbury has kindly presented the College library with fifty odd volumes of reports and miscellaneous works; some of which, like Foster & Whitney's report on the Geology of Lake Superior, are of great value.

We call the attention of the Hon. Street Commissioner of Manhattan City to the bridge over the ditch southeast of Prof. Gale's residence. At the present time, this bridge is in a condition such as to make its passage perilous to horse or vehicle.

President Fairchild lectures at Lawrence, on Tuesday evening, before the University students. We have not learned the subject of the address; but we feel confident that our University friends will be entertained and instructed by anything President Fairchild may have to offer them.

At the meeting of the Breeders' Association, held at the College on Thursday afternoon, it was decided to hold a Breeders' Institute in Manhattan, early in February next. The Association expects to make this institute worth attending. Already several prominent breeders from abroad have promised to be present and to furnish papers.

Referring to an article on the education of girls, by Dr. Julia Holmes Smith, Sup't Murdock, in his excellent little paper, the Educational Advocate, speaks thus kindly of the College:—

Such an industrial school as is spoken of by Mrs. Holmes, is the State Agricultural School, located at Manhattan, Riley county, of this State. There both the boys and girls of Kansas can secure an excellent industrial education, with tuition free.

Mr. William Booth, of Leavenworth, in a private letter, informs us that he has recently purchased sixty-four Merino ewes and ten rams from the celebrated herd of Hon. C. R. Gibbs, Sec'y of the Wisconsin Wool-growers' Association. By this purchase, Mr. Booth has secured the very best Merino blood obtainable; and, as he intends to breed with the object of furnishing our sheep-raisers with breeding animals of the highest grade, our wool-growers will do well to make a note of this fact.

Where, oh, where is the prognosticator of celestial and meteorological phenomena? The "oldest inhabitant" has not, to our knowledge, ventured the highly original remark that this fall is just like that which preceded the terrible winter 18 something or other; while Prof. Tice maintains a judicious silence, which is fully justified by his previous experience in the prophecy business. Only the "new hand," a Professor Venner, from a little Canuck village where icicles abound ten months in the year, shouts lustily that we are to have a severe winter "in places;" which is exactly our view of the matter. Are the corn husks and musk-rat houses the only authorities on "futures" in meteorology?

SOCIETY HALL, Nov. 13th, 1880.

Webster society was called to order by Pres. Knaus. After the usual opening exercises, the officers for the ensuing term were inaugurated.

Pres. Knaus made an earnest speech upon the object and advantages of our Society; and then stepped down and out to fill the usual office of retiring presidents, that of marshal. Pres. Thompson assumed the chair with a few spirited remarks which showed how thoroughly his heart is in the work of the Society. The debate was then opened upon the question, "Resolved, That Socialism and Communism tend to the utter demoralization of society." The affirmative was led by M. H. Markum, supported by Geo. F. Thompson. They were opposed by J. C. Allen and S. C. Mason. This proved to be one of the most stoutly contested debates of the term, but was finally decided for the negative. Under the order of extemporaneous speaking, the results of the election were quite warmly discussed; our Democratic members seeming quite happy over the prospect of a President in four years more. Mr. Bailey then read an excellent composition on habits. An interesting programme is prepared for next meeting, including the reading of the Reporter. Students can all afford one evening in the week for the sake of the discipline and improvement to be obtained from these meetings. SCRATCH-PAPER.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 p. m. Ladies admitted. New students cordially invited to attend.

WM. J. LIGHTFOOT, President.
MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

Geo. F. THOMPSON, President.
S. C. MASON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.
G. H. FAILEYER, Secretary.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY. KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.—All persons who are en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering, Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange are issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Failyer, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

Instrumental Music.—Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three. Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught. For terms, see heading "Expenses" in article entitled, "The College Year."

Agricultural College Lands.—These lands are in the market, as provided by law, and for sale for one-eighth cash, balance in seven equal annual payments with ten per cent interest, payable annually. The lands are all choice selections, and prices range generally from \$5.00 to \$6.25 per acre. Some of the best tracts are appraised at from \$8 to \$10 per acre, and they are well worth the money. These lands are located in Washington, Marshall, Clay, Riley and Dickinson counties. For particulars, maps and descriptions, address L. R. Elliott, Agent, Manhattan, Kas.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 20, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry, Mineralogy.
	SPRING TERM.	Geometry. Entomology, Anatomy. Analytical Chemistry, or House- hold Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying out fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department. Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

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In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

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under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

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where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

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Adams



THE INDUSTRIALIST



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The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

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Indian Corn as Fuel.

During recent years, western farmers have sometimes found it expedient to burn corn in their stoves, as well as feed it to their cattle; and this fact has naturally raised the inquiry, in what cases and to what extent it may be possible to utilize this cereal as a fuel. In regard to the market price of corn, it varies, of course, from year to year, according to the supply and demand. It is not very long since corn was sold, at some points in the west, for much less than the present price. The crop of the present year will, doubtless, be large, in spite of local exceptions; but what the market price will be is not yet known.

The simple fact that, in various sections of the country, and in repeated instances, it has been employed as a fuel, is presumptive evidence that there is, under certain conditions, a profit in using it. What these conditions are, it is not very difficult to determine. It is, first of all, a question of locality. In sections contiguous to coal mines or timber belts, farmers are not very likely to burn their corn. But it is easy to see that in regions remote from these sources of fuel, and especially where corn can be produced at a cost exceptionally low, there may be, not only economy, but a clear profit in converting it into fuel. In fact, it may be assumed that wherever Indian corn can be raised at a cost as low as eight or nine cents per bushel, it will pay as a fuel, unless fire-wood or coal is so near at hand as to be delivered without cost of hauling.

But there is another factor that has thrown additional light on this problem. It is found that the stalks of corn, when bound into compact bundles of suitable size, may be conveniently used for fuel, and often with decided economy.

It is said that in some parts of the West, even hay is so abundant and so cheap as to be utilized in firing up engines, and that in England straw is used for the same purpose; and that both these materials have proved to be economical and profitable as compared with coal or wood. It was found, on a careful examination of this question some years ago, that when coal cost \$3 a ton or over, corn, at eight or ten cents a bushel, was the cheaper fuel of the two.

According to the experience of a Nebraska farmer, in a trial of corn against wood, it appears that by going twenty miles he could buy green cottonwood at \$9 a cord, paying for it with corn at fifteen cents a bushel. At this rate, counting the expense of two days' hauling, one cord of wood costs a hundred bushels of corn, which will burn eight times as long, and make a better fire than wood. An Illinois farmer has reported to the Chicago Tribune, that the "cobs of corn are worth, for fuel, ton for ton, as much as the common Illinois coal, the summer price of which, by the car-load, is \$3.50 per ton." Now, if it be a fact, as many affirm, that corn can be raised in some parts of the West at a cost of \$2 or \$2.50 per ton, it is hardly a matter of surprise if farmers occasionally find it expedient to use a part of the crop to warm their houses or cook the family dinner.

But there is a class of people who can see nothing but waste and extravagance in the "shocking" practice of burning corn. It has been affirmed, by a statistical writer, that "the use of corn for fuel always indicates over-production and loss;" and, with more sentiment than logic, he is afflicted to find that "the precious staff of life is thrust into the stoves of our western farmers for fuel." Such weak nonsense as this may do very well for Mrs. Grundy; but, for a writer addressing an intelligent public, common sense would be more appropriate. It is well that farmers have the sense to perceive that the fuel which costs the least is just the

kind to use; and that when corn is employed to keep the family from freezing, it is just as truly "the precious staff of life" as when it keeps them from starving. One thing, at least, is certain. The man who puts corn into his stove at a clear profit of \$2 a ton, which is sometimes possible, is wiser than his neighbor who ships it to a foreign market at a possible loss, which occasionally happens.—*Business Farmer and Experiment Record.*

The Oldest Newspaper.

There has lately been discovered, in the library of the University of Heidelberg, a copy of a newspaper which proves to be the oldest periodical of which there is now any certain knowledge. It is a quarto volume, bearing the date 1400; and is supposed to have been printed by John Carolus, of Stratsburg. The paper was issued weekly, each number consisting of two sheets. It was mainly occupied with letters from correspondents in adjoining States, which were contributed regularly. The letters from Vienna were about eight days on the route, from Venice fourteen to seventeen days, and from Rome twenty-one days. When the matter contained in the letters together with the news retailed at second hand, failed to fill the sheet, the remaining space was left blank.

Intelligence of every sort found a place in the journal. Among the most interesting occurrences noted, was the manufacture of the telescope by Galileo. The correspondent from Florence, writes on September 4th to the effect "that the government of Venice makes a considerable present to Signor Galileo, of Florence, professor of mathematics at Padua; and increased his annual stipend by one hundred crowns, because, by diligent study, he found out a rule and measure by which it is possible to see places thirty miles distant as if they were near; and, on the other hand, near objects much larger than they are before our eyes."

The news received from Prague affords a disturbed picture of plunder and murder in that city. It appears that at this period men and women were daily seized by bandits, robbed, strangled, and thrown into the Moldau. Seven bodies were taken from the water in one day and at another time seven malefactors were apprehended, who confessed "that on the 18th of this month they threw about fourteen persons into the water, and that their band numbered eighty, who were for the most part natives of Prague."

—*Exchange.*

THE wheat market is booming again, an advance being evident of 4 cents per bushel during the past week. Corn is also higher, and is being sought for by the speculators and shippers. It is conceded that the foreign demand for wheat and corn for the next two months will be quite liberal, and hence the present activity. Oats have been cornered for November, though it is not certain that the corner will be sustained; still the chance for obtaining good prices during the remainder of the month are very good. Barley and rye are also higher, and advancing. There appears to be no grounds on which to base any decline of any consequence in the grain markets, the remainder of the season. The visible supply at home and abroad is estimated at no more than what will be actually needed for consumption.—*Colman's Rural World.*

California is pressing and preserving potatoes by a process which dries and leaves them so that it is claimed they can be kept for years in any climate. Many tons of these dried potatoes have been shipped to England, where they are in brisk demand.—*Husbandman.*

Our Exchanges.

A huge tusk of an immense mastodon was discovered near town this week, by a gentleman of a scientific turn of mind, and shipped east for examination.—*Walnut Valley Times.*

W. B. Taylor, at one time editor and proprietor of the *Gazette*, will leave in a few days for Brunswick, Missouri, there to take charge of a newspaper. We wish him success.—*Wyandotte Gazette.*

Wheat never looked better. The ground is full of water. In our thirteen years experience in this State, we have never known such a fall as this to be followed by a bad crop.—*McPherson Republican.*

The greatest obstacle in the way of organizing a church here is the healthfulness of the climate. People are prone to presume on the fact that no death has ever occurred in Grainfield or vicinity.—*Grainfield Republican.*

Honors fell thick and fast on General Hancock, his defeat in the presidential race to the contrary notwithstanding. Seven gold-headed canes were but a portion of the plunder that came to him during the campaign.—*Exchange.*

About 11 o'clock last night, a few moments before the east bound passenger left Newton, the round-house at that city suddenly burst into flames, and was entirely destroyed, together with the store-house and two engines,—the loss amounting to about \$40,000. The cause of the fire is unknown; but it is thought that the flames originated in the round-house office.—*Capital.*

Farmers who have been here for years and have had few failures, realize that their lands are worth just as much now as they ever were. Those who desire to sell will find that money will be made by holding and demanding a fair price. It is only a question of time when this country will be overrun. To what other country can the large emigration to the United States go? The boom is already assuming importance.—*Larned Chronoscope.*

Some of the coal stored in the University coal-house, has taken fire, caused by spontaneous combustion. A force of workmen have been engaged for three days in shoveling the surface away, so as to reach the burning portion, and further damage will probably be avoided. It is said that the fire originated in a couple of car-loads of coal that had been exposed to the rain before being stored. If such is the case, our citizens would do well, not only to exercise a wise precaution in buying coal, but also see that it is not placed where fire would be of any damage. The new coal-house is built of stone and corrugated iron; and no possible damage can occur to it. The only annoyance arises from the escaping gas, which causes a slight inconvenience to the workmen around the engines. The University authorities may congratulate themselves, that both the engines and the coal are removed from the main building, since it lessens the danger from fire to a great degree, and thus saves any fears that the Emporia disaster will be repeated here.—*Lawrence Journal.*

It is not economy to have too few brooms. One for the sleeping-rooms up stairs, one for the parlor and sitting-room, and one for the kitchen are not too many. As they are worn, they may be passed down a grade at a time, the new one always being reserved for the parlor. If the new broom is allowed to stand in cold water for twelve hours, afterwards drying it, it will last much longer. A broom should never be permitted to stand on its brush, as it makes it one-sided and ill-shapen. Hang it up, by a loop in the handle.—*Exchange.*

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 27, 1880.

H. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Misuse of Useful Information.

The world is always wanting a better, more accurate information upon every-day affairs. The best of newspaper interviewers is not quicker at asking questions than is the constantly growing world of civilization. Knowledge is the food for thought, and thought moves the world by its use.

To supply this want, the great corps of scientific workers and the army of inventors are busy constantly. Cyclopedias are but fairly before the public, when some new fact is discovered to supplant them with a new edition or a new compilation. All of us are again and again surprised and pained to find that some lesson learned by us at the dear school of experience, might have been found in full, if our information were more complete in the experience of others. This is the waste of ignorance, we say, and at once undertake to supply our want by cramming with facts. So far, we are right: if a want felt, can be met by seeking facts, from men or books, we are foolish to go without it. Everybody is dependent upon useful information; and nearly half the work of the world is in furnishing such important truth.

But a fact is nothing to one who cannot fit it to use. We see men packed full of cyclopedic knowledge, unable, nevertheless, to use the most common truth. They need "the little grain of gumption that shall make their learning useful." They lack the trained senses, the quick perception, and the ready judgment, which make up what we call "good common sense." These come from practice in *thinking*, rather than from a large fund of information. "Beware of the man of one book," is a maxim which illustrates the power of thinking over simple learning. Students who early learn to think, make most of a course of reading or study, because facts and principles then become a part of their life and action, instead of something to be remembered. Students who are anxious at once to master the contents of a library, must change their disposition, or cease to be masters of themselves. To know and to do are different things: though one may be essential to the other, the power that makes knowledge of use must first be gained by action. Who is there that cannot say, like the little idiot boy whose shortcomings were excused by the remark, "Josey doesn't know any better," "Josey knows better than he does"?

It is the first task of education to awaken thought along with, and by means of, truth. But we make a grand mistake when we suppose that every fact useful to a thinker may be made the true means of training to think. Our schools and colleges fall short of their object, when facts are packed into memory because men use them in the world, while the ability to think is not yet provided for. Many of the sciences, as taught in schools, fail of their practical use, because there is no capacity behind them. Capacity increases by use of facts, however simple; and, therefore, many practical men, without even ordinary means of information, do more than some who have the best of knowledge at their tongue's end. The old maxim of Socrates, "Know thyself," is not too old for us of to-day; and the first facts and methods to learn are our need of thoughtfulness and the way to gain it.

It is, then, worse than waste to spend the years of schooling in a hurried drill of memory without a power to use it; and one who

plans to teach a little of everything useful, expecting great results in practical energy and accuracy, will most certainly be disappointed. Teach in the schools as many general truths as can be gathered about the life of pupils, so as to have constant significance: train children to think more of relations than of facts; and soon the facts themselves are a necessary—not merely convenient—part of their knowledge, and they will have them.

No two persons need exactly the same set of facts; but the underlying principles by which thinking is regulated are the same for all. We can best train to think by the use of facts lying nearest to the wants of our pupils; and a skillful teacher adjusts each principle by illustration to the varied life of his pupils. We can use science for such training, and bring its useful facts into daily thought; but we must put the thinking first in importance. Any other use of general information in schools will soon prove itself a misuse.—*President Fairchild.*

Scientific Clubs.

The time of year for the historical debating club and the time-honored spelling school, is again at hand; and, as it seems an imperative necessity in our villages and country neighborhoods to have "some place to go to" these long winter evenings, and as the reading club, debating club and spelling school are getting old, I wish to propose a new game. It is this: suppose that, instead of reorganizing either of the above-named clubs, we organize a scientific club. If, however, it seems desirable to retain the old organization, we can have the scientific club to meet on alternate evenings with it,—say fortnightly.

The advantages of such an organization are many. We would have the same opportunity for social culture that exists in either of the other clubs,—the same facilities for discussion afforded by the others, with this addition that we would always have questions that are of importance to each of us, and questions that are always founded upon fact. In preparing papers to be read before such a society, we have as good a chance to air our spelling as we have at a spelling school. We must study, or at least "read up," on the topics for discussion, in order to be able to present it in an intelligible form; and by so doing we add to our present stock of information.

It would be an incentive to original study, and awaken a desire to test many so-called scientific theories before accepting them as facts; and also teach us habits of carefully scrutinizing all the available evidence for and against the theory under consideration, rejecting such as we do not fully comprehend, and distinguishing between fancy and fact, or between wild supposition and scientific theories.

It is said that many suppositions purporting to be scientific theories obtain a very ready credence and even popularity among the generality of the people, in a very unscientific manner. Is this because some man sets up his standard as a scientist, and issues his *ipse dixit* as being incapable of flaws, unerring in logical reasoning, and absolutely accurate in fact; and we, not being specialists, admire the very learned appearance of his disquisition, and are easily led to accept it as correct without putting it to the proof?

We cannot lack for topics. The newspapers of the day are full of them. The omnivorous reader of current American periodicals can scarcely place his hand upon an issue of any paper, from the most elaborate and high-priced quarterly to the smallest country paper, that does not publish

either original or clipped items and articles on scientific discovery and research. Scientific discoveries are about as common as steamboat disasters in foggy weather, and some of them almost as startling; and the reading public demands them as much as any other items of news.

Great efforts are making to introduce more of science teaching into our common schools; and we all seem agreed that it can be done advantageously, the only question being as to methods. If it can be taught successfully in a common school, to all ages and grades of pupils, it can certainly be discussed to advantage by the youth and adults of the same neighborhood. We have yet to meet with the school children so young, or the men so old, that some form of scientific knowledge would not interest them.

Do not go into a club of this kind with the idea that in a few weeks you are going to become a scientist. Your chances for becoming President of the United States in the same length of time are better. All the results of modern scientific research do not point out an easy road to learning. But if, when the winter is over, you have the satisfaction of knowing that you know more than you did, and of knowing that you are better able to learn than you were, you will have accomplished something: and you may be able, by the knowledge thus gained, to put some little invention of your own into some of your machinery, to its improvement and your advantage; to know what kills grapevines or pear-trees; and supply a remedy, or to—to to split a water-elm easily.—*Sup't Graham.*

Power in Thanksgiving.

At the close of this year of general comfort and prosperity, the proclamations of President and Governor meet a hearty response. Farmers' homes are full of a grateful sense of strength and hope, as they count their wealth of crops and herds. Merchants stand over their filling tills with a satisfied look, and a grateful sense of comfort in store. Manufacturers watch the rapid motion of trade with a pleasant excitement over prospects for a lengthened bank account. Great thoroughfares stretch out their lengthening trains, and strengthen their road-beds for the increased traffic already begun. Even schools and colleges are pervaded with the cheerful congratulations that increased numbers and steadier attendance bring. So, the most of us are of one mind in thanksgiving, even if we only thank our stars.

All of this is well for us and the world. Prosperity is good for its own sake, as well as useful to our generation. But it is not to be measured only by the heap of good things over which we offer thanks. A still greater good is found in the increased energy it brings for the future.

Wealth is found to be an advantage principally as it serves for future welfare, in the shape of capital. Give to a youth full supply for all his wants, real and conceivable, through a lifetime, and the chances are that you have made him an imbecile or a brute, with no higher incentive than appetite. That intelligent and energetic foresight, "the long look ahead," which makes the best part of enjoyment, he finds no place for. So, in our thanksgiving there is danger of our saying, "Take thine ease," in such a way as to diminish our real satisfaction.

This season ought to be to all classes a time of increased power. It is when the "thought for the morrow" is least anxious, that the plans reach farther and stand more complete in details. One who is obliged to live from "hand to mouth" never finds a

way to use to good advantage what he does obtain. Time, means, and strength are often wasted, because we do not know that we have them long enough beforehand to plan for their use. Our thanksgiving now can help us to power in the future through relief from "the carking cares of poverty," awakening a faith in our life and surrounding providence that enables us to sow, trade, manufacture, and teach with better adaptation of means to ends. Instead of being more wasteful, we may save by our cheerful provision for growth and exertion. Only he who cheerfully takes his meals in faith that by their strengthening aid he can do something, ever lays any plans for future doing. Cheerfully thankful for our daily bread, we eat to live; and, living in thankful mood, we thrive, and help the thrift of others. A better harbinger of future prosperity, through clear-headed effort, could scarcely be found, than this same general spirit of thanksgiving. Even the weak may be strengthened by it; and those unfortunate ones whom failure of crops has driven from their homesteads for the winter, may catch new energy and hope from the general cheerfulness. Let us be thankful again for this sense of future power. So you may endure this thanksgiving sermon.—*President Fairchild.*

Educational Gossip.

It is reported that the walls of the school-house in Smith Center have cracked so badly, that the building is unsafe. Quite a number of children are kept out for fear it will fall. The school trustees should have an examination made by a competent man.

C. Hutchins, a teacher of this county, was brought to town on Tuesday, charged with assault and battery; the offense consisting in having punished a pupil with undue severity. He pleaded guilty, and was released on paying a fine of \$3 and the costs of the action.—*Woodson County Post.*

"Resolved, That water is more beneficial than land," has been the theme of no less than three lyceum debates in Kansas this fall. We are glad that the question receives such universal attention, for it is a very grave one; and it is about time that the good people should know where to side at the next general election. Keep on debating it.

The *Temperance Banner*, of Osage Mission, which had reached its third volume, has suspended,—followed the *Palladium* to the shades of the past. It announces that having started the paper solely in the interest of prohibition, and the amendment being carried, it considers its mission ended. We do not coincide with the *Banner* in this, but believe that just now, and during the coming winter, the struggle will be warmer than ever. The amendment needs all the friends it can get.

Some philosopher has said that the boys are the exponents of the unuttered sentiments of the men of a community. This principle was perhaps illustrated on Friday before the election at the 2d ward school-house. The Garfield boys determined to hang the Hancock boys. The first victim was a small boy, the son of Mr. Jos. Hooker. They put a rope around his neck, carried him to a convenient tree, threw the rope over a limb, and, as one of the witnesses said, drew the boy up until his feet were clear of the ground, and until his face showed signs of strangulation. They did not let the boy loose until one of the girls who witnessed the "fun" threatened to inform the teacher, and started on the run for the school-house. This inclined the embryo roughs to stop the sport. Mr. Hooker had them arrested; and the trial came off before Squire Hobbs on Wednesday last. Three of them were found guilty on a charge of assaulting and beating, and were fined ten dollars and costs. This is a legitimate expression of the spirit of partisanship in politics. It is a symptom of the unhealthy condition of the public mind. The fact that it should occur at the threshold of the school-house is an ominous pointer. People may treat this occurrence as a trifle; but it is not. It is a warning that there is something "rotten in Denmark."—*Wichita Beacon.*

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 27, 1880

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Sheltz, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Fairer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Skating on the Blue River, Thanksgiving day, Nov. 25th, 1880. Make a note of it.

Regent Purcell has presented to the College, for our cabinet, a very fine aboriginal stone hammer, which was found in Wabunsee county, ten miles southeast of the College.

The classes in geometrical drawing have finished Prof. Smith's four books,—the usual term's work; and are taking up free-hand drawing in the flat, greatly to the delight of the lady members.

Fully one-fourth of the large congregation that listened to the able discourse by the Rev. A. B. Campbell, at the M. E. Church on Thanksgiving morning, were connected with the College.

The eleventh volume of the Encyclopedia Britannica, which should have been delivered by the agent last August, is just received. Volume twelve will be placed in the College Library in January next.

A frost-proof room, directly accessible from the analytical rooms by an easy flight of stairs, has just been constructed in the cellar of the Chemical Laboratory. This is a much-needed improvement.

The results of the second written examination of the term are exhibited upon the grade sheet, on the bulletin-board. As usual, those who have conscientiously done their best every day of the last five weeks, stand the highest. The general record is very good.

We have just accidentally learned that two of our old students, William Rollings and Etta Coolidge, of Delphos, Ottawa county, were married several weeks ago. This is all right; but, young people, why are such interesting items of news kept from us so long?

A fine clock, with an automatic attachment for ringing electric bells for class purposes, similar to the one in use in this Institution, has lately been constructed by Mr. M. A. Reeve, a student, under Sup't Graham's supervision, and forwarded to the Mississippi Agricultural College. When President Lee, of that Institution, was here last summer, he was so much pleased with our bell system, that he adopted it.

Thanksgiving day was duly observed by the College people. At Prof. Platt's, there was a large family gathering,—about forty taking dinner. There were several dinner parties gotten up by the students who are keeping house. The enterprising young ladies of the M. E. Church held a neck-tie festival, which was largely attended by their College friends. The ice on the Blue furnished sport for the more athletic. On Friday morning, nearly all were in their places, ready for work.

The recent promotion of Mr. W. A. Campbell, a former student of the College, to the Division Office at Wamego, reminds us that several of the Telegraph Department students of last year are doing well. Of them, we name Miss Emma Hoyt, manager of the city office at Junction City; Miss Bessie Larsh, manager of the Western Union city office at North Topeka; Mr. J. Garfield Lay, operator and agent at Olesburgh; Mr. L. F. Gault, operator at Great Bend. These young people are speaking illustrations of the work that is being done by the industrial departments.

President Lee, of the Mississippi State Agricultural College, writes that the first term of the newly organized Institution, is progressing very satisfactorily,—235 students being present on Nov. 11th. The buildings, with the exception of the dormito-

ry, are completed; and this will permit the occupancy of over 100 students by the end of the present month. The main chairs of the Faculty are filled by enthusiastic young scientists;—that of chemistry, by Prof. Rob't F. Kedzie, who at one time had charge of the Chemical Department of this College, while his brother, Prof. Wm. Kedzie, was in Europe.

Since October 1st, the Loan Commissioner has made the following purchases of school lands: Republic county—Dist. 30, \$300; Dist. 48, \$350; Jewell—Dist. 122, \$187; Dist. 4, \$400; Dist. 112, \$240; Dist. 22, \$700; Sumner—Dist. 111, \$210; Dist. 133, \$125; Dist. 135, \$339; Dist. 121, \$500; Dist. 154, \$375; Barton—Dist. 54, \$185; Dist. 17, \$300; Chautauqua—Dist. 4, \$300; Dist. 5, \$200; Smith—Dist. 51, \$474; Dist. 92, \$290; Mitchell—Dist. 99, \$200; Dist. 58, \$500; Phillips—Dist. 31, \$390; Coffey—Dist. 63, \$800; Labette—Dist. 43, \$800; Osage—Dist. 96, \$700; Stafford—Dist. 22, \$800; Johnson—Dist. 24, \$800; Franklin—Dist. 36, \$800; Morris—Dist. 50, \$4,700. Total, \$16,365.

The two Ulrich brothers and the two Lynch brothers are making preparations to establish a machine shop in Manhattan. All of them have been students of the Agricultural College. The senior member of the firm, Will Ulrich, is a graduate and an M. S. Every one of these four young men is a born mechanic, and each left the College with a good degree of acquired skill. As soon as their shop is open, the press upon which the INDUSTRIALIST is printed will be put in their hands for some long-needed repairs.

Whatever these young men undertake to do, they will do well. Of this their patrons can be assured. If the firm does not succeed here, it will be because there is a lack of this kind of work to be done, in Manhattan and vicinity. In a large manufacturing town, we know they could build up an immense business.

The Webster Society met Nov. 20th, in Society Hall, with good attendance. Society was called to order by President Thompson. Secretary Mason being absent, a Secretary pro tem was appointed. After roll-call and devotion, W. S. Myers was inaugurated Corresponding Secretary. The name of E. A. Smith was balloted on for membership. Debate was decided in favor of affirmative. Extensive speaking followed with unusual interest. The Reporter was presented by W. C. Palmer, and showed unusual care in preparation. Committee on programme, for the following month, was appointed as follows: W. Knaus, W. S. Myers, S. N. Peck, and J. W. Hamilton. Question for next meeting, "Resolved, That all lands ceded by the United States for the building of railroads should be confiscated, if not sold within three years from building of the roads. Affirmative, F. A. Hutto and D. S. Leach; negative, H. L. Call and J. C. Allen. Reporter to be presented in two weeks by L. H. Neiswender. TINTINNABULUM.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the one rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses. Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00

Private lessons, 1 a week, on any instrument, .60

Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting

time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms. Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 p.m. Ladies admitted. New students cordially invited to attend. Wm. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

GEO. F. THOMPSON, President.

S. C. MASON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.

G. H. FAIRYER, Secretary.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East.....	12:20 P. M.
No. 4, going East.....	12:19 A. M.
No. 1, going West.....	4:00 P. M.
No. 3, going West.....	4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan.....	8:20 A. M.
No. 1 arrives at Manhattan.....	7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37ff.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Dress-Making and Millinery.—Daily instruction and drill in hand and machine sewing; cutting, fitting and making dresses; and all branches of millinery, by a practical teacher.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry. Photography and Household Chemistry.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker. Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange is sued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

THE INDUSTRIALIST.

SATURDAY, NOVEMBER 27, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

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where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

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J. B. Adams



THE INDUSTRIALIST



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TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Curing Hams and Bacon.

The *Journal* has, on more than one occasion, called the attention of its readers to the fact that in very many cases farmers will find it more profitable to kill their fat hogs at home, and cure the meat, than to sell "on foot" at prevailing prices. Go into any of the grocery and provision stores in the towns and villages of Iowa, Missouri, Illinois, and other western States, and you will find "sugar-cured hams" on sale, that have been bought in Chicago or St. Louis. Perhaps the very ham that a country merchant in Iowa sold his customer, in July last, was cut from a hog that this same customer sold, eight months ago, to be shipped to Chicago. It has served the railroad companies a good purpose; for they carried this hog three hundred miles to Chicago, for which they were paid, and they brought the ham back an equal distance, for which they were also paid. It has served the dealers a good purpose; for the Iowa buyer, the commission man at Chicago, the curing establishment, and, last, the country grocer who sells the ham to the man that raised the hog, have all had a commission out of it.

This is simply a wasteful, foolish practice. Every country village ought to get its supply of hams and bacon from the neighboring farms: and farmers themselves ought never to have to buy supplies of this nature; such a practice always shows a lack of that economical and intelligent management which is essential to success in any business.

The curing of hams and bacon is a very simple process, and is well understood by most of our readers. The ham should be trimmed pretty closely, so that there shall be no large, loose masses of fat lying in flabby folds at its lower extremity; for to leave this on is simply to have so much lard wasted. The sides may be cut in any desired shape for convenience in packing; and they should always be salted away in a separate vessel from the hams, shoulders, and other parts containing bones.

Speaking from our own experience, we would say that hams have a decidedly better flavor, and the meat retains a more natural color, when nothing but plain salt is used in the curing. If the work of salting is carefully attended to, the hams, when cured with salt alone, will be ready for smoking in six weeks or two months, owing to the size of the hams. The saltpetre has a tendency to harden and redden the meat; and, for our own table, we would never use it. It undoubtedly accelerates the curing process; but it does so at the expense of the flavor.—*National Live-Stock Journal*.

I Rise to Say.

For some months, I have scarcely read an agricultural or live-stock paper that did not contain a longer or shorter article setting forth, that the pork of our improved hogs is too fat; or, as some of them put it, "as pigs are now bred and fattened, they are little more than animated lard." So much of this talk is calculated to make the unthinking or inexperienced reader suppose the long years spent by careful, painstaking breeders, in efforts to change the character of the old-time prairie-rooters, had been wasted; and the result was a race of swine almost worthless, and an undesirable lot generally, either to sell or to use. I am not positive, but I think the most of this racket was raised by something written by Col. F. D. Curtis, of New York; and now his sentiments are being magnified and re-echoed by the eminent agricultural quill-drivers, east and west, who don't know a boar from a well-auger, who are telling us how horribly indigestible the meat of the modern pig is, as compared with "the long-snouted pig that their infancy knew." Their utterances evince a yearning for the ancient land-pikes,

the ill-favored, pelican-snouted elm-peelers and razor-backed hazel-splitters, which could readily drink buttermilk from a jug, and had bow-knots tied in their tails to prevent their crawling through the fences. So long as these writers want to raise such, I have no objection, as it is a free country, and there are no laws to prevent a man making a fool of himself; but our sensible, practical farmers will not be readily persuaded to throw aside the improvements that cost so much time, effort, and study, and go back to the point where their ancestors began. The statement that the compact, blocky hogs, with fine bone and small offal, are not ready sale, is false, as every man knows who ever sold, or tried to sell, a bunch of them; and they not only sell, but bring a premium over the lean, transparent sort every day in the year.

The farmers of the United States, in this year of our Lord 1880, have, as a rule, I am certain, more and better hogs than were ever before seen on the face of the earth; and I want them to stand by what has been accomplished, and maintain it. I do not mean by this that our swine are perfection, nor that the best system of feeding and management is always pursued; but I believe we are nearer right than ever before, and there is no occasion for any step backward, or a return to the old-fashioned sort, even the one longest known and best advertised; viz., that run down a steep place into the sea. What we want is a better system of feeding and a greater variety of food; less corn and more clover, artichokes; more beets, man golds, pumpkins, clean water and shade; more pasture, more room, and fewer stys. Our hogs may be improved some, but our slipshod way of caring for them needs attention most.—*F. D. Coburn, in Kansas Farmer*.

Origin of the Cereals.

It is a matter of interest that most of our cultivated grains cannot be traced to their origin. The oat has been found wild and thoroughly indigenous, though not in as perfect a condition for agricultural purposes as the forms we grow; still, there is a doubt that the cultivated and wild forms are the same. Of wheat, no form has ever been found wild that any one could say was the parent of our kind; and botanists believe that either wheat has so widely diverged from the wild original that the relationship cannot be detected, or that the wild original has entirely disappeared from the earth's surface. The last position is the generally accepted one, though a quarter of a century or more ago a French gentleman tried a series of experiments by which he concluded he had raised wheat from a wild grass of that country, by successive selections through several generations. These observations, however, do not seem to have carried weight with them, as we see no reference made to them by those eminent men who have been recently discussing the question.

Our Indian corn seems to be more of a mystery than any of the others; for no one has ventured an opinion, that we know, as to whether it is an improved race from some wild thing now lost, or the original wild plant itself, destroyed by nature, though preserved by man. It was found by our old-world emigrants when they first landed here, in cultivation by the natives, but nowhere wild. This was especially the case with the Indians of Central America; but even the northern Indians, or at least the squaws, grew corn. The Winnebagoes and other tribes about Lake Michigan made corn culture an especial feature, using shells in the place of spades or hoes; and, to this day, the remains of their "corn-cellars" (holes in sandy ground) and corn-hills are among the most interesting of their remains.

* * * —*Germantown Telegraph*.

A Puzzling Usage Explained.

The *New York Journal of Commerce*, in answer to an inquiry, says: The word "addressed," on letters to be sent by messenger instead of mail, is used chiefly by foreigners resident here. It grew out of the memorandum matter on the back of an official document as to its contents, "John Jones, addressed;" and adopted by imitators, who thought that "addressed" was used as a substitute for address. The word "present" was formerly used in exchanging diplomatic notes, where the writer and receiver were both in the same presence; and the intercourse was in writing to avoid possible misunderstanding of its character. It meant simply, "To—, here present." Afterward, it was added to the official's name on the superscription, when he was near at hand and the missive was to be delivered to him by the writer's messenger, the fiction that he was present being maintained as reality. Many writers, supposing that it meant that the letter was "to be presented," continue to use it in correspondence by private hands, to distinguish the address from that of a letter sent by mail. The better way is to add the address; as, "John Jones, Madison square," or to write the simple name, and give the address to the messenger.

Our Exchanges.

An editor out in western Kansas was in prison for libeling a justice of the peace; and, when he departed, the jailor asked him to give the prison a puff.—*Exchange*.

Dennis Thomas, a negro boy of fifteen, was convicted yesterday of placing obstructions upon the Caldwell branch of the A., T. & S. F. Railroad, because he was ejected from the cars. He will go to the penitentiary for from one to ten years.—*Exchange*.

Pawnee Rock ships this fall 30 car-loads of broom-corn, which nets the farmers in that vicinity over \$15,000. This is a considerable sum for one township to receive for one product alone. The farmer who has from 10 to 20 tons of broom-corn to sell this fall, is in great luck.—*Great Bend Register*.

Maj. Morrill is the gentleman here who gives fifty sacks of flour per month to the suffering out west. Since some correspondent has published the fact in the *St. Joseph Herald*, we presume we are betraying no confidence in republishing it.—*Hiawatha Dispatch*.

Harvey county has the sheep mania badly. We are being fairly flooded with the profitable animals. We are very glad to notice this. The stock of cattle is largely on the increase, and a good deal of it blooded stock at that. If we are only given time, we will rival the best stock counties in this State or any other.—*Newton Republican*.

John Stalter, of Rock, is mad; and he has a good reason to be. A lot of dogs got at his sheep the other night; and, in running from them, some of the sheep ran into the creek and were drowned. Among them were two valuable "bucks;" one of which had cost Mr. S. \$100, the other one being worth at least \$50. Mr. Stalter cries aloud for a law of extermination, and he is about right. Those two sheep were more valuable than all the worthless curs in the country.—*Cowley County Telegram*.

MR. J. N. LOCKYER's theory that the so-called elementary substances of chemistry are in reality compound bodies, is based upon the results of his researches with the spectroscope, and particularly his spectroscopic study of the sun and stars. It is interesting to know that purely chemical investigation points to the same conclusion.—*Exchange*.

THE INDUSTRIALIST.

SATURDAY, DECEMBER 4, 1880.

H. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE last month is remarkable for being the coldest November on record at this place. Our records were begun in 1859. The average temperature of preceding Novembers is 40°.37. The coldest preceding November was in 1872; the average of this month being 34°.08. The warmest November was in 1866; temperature, 46°.35. The average temperature of the November just past, is 31°.01: average temperature at 7 A. M., 25°.20; at 2 P. M., 38°.86; at 9 P. M., 30°. Minimum of the month, 7°, occurred on the 18th, 21st and 26th; maximum, 67°, on the 1st. Mean barometer, 28.66; highest, 29.16; lowest, 28.25. First snow of the autumn, on the 10th, three-fourths of an inch; light snow on four other days; whole depth during the month, one and three-fourths inches. Rain and melted snow, 1.97 inches, .30 of an inch above the average of this month.

The Epizootic.

This strange malady, in a mild form, has infected a large proportion of the horses of this vicinity, without having, to our knowledge, terminated fatally in a single case. At this writing, the epidemic has evidently spent its force; and it seems to be only a question of a few days when sneezing horses will be known no more. However mild as this disease has been, the owners of horse flesh have been put to no small inconvenience by it.

At the late meeting of the Central Kansas Breeders' Association, the question how best to treat horses suffering from this complaint, came up; and the views of several gentlemen of large experience were given. The opinion seemed to be that with ordinary precautions, no medicine need be used in the treatment of the disease. All agreed that the horse, as soon as taken sick with the epizootic, should be exercised very little if at all; and, particularly, the horse should not be exposed to any sudden changes of temperature, or to severe exposure of any kind. It was also advised that rich and "healthy" foods like corn should not be fed during the prevalence of this complaint; but instead oats, and particularly bran, were recommended. All the speakers agreed that severe exposure and sudden changes of temperature, and particularly over-exertion, were matters chiefly to be guarded against. Several instances were given of large livery stables which, by closing up entirely on the first appearance of the epizootic, passed the ordeal at the minimum of expense or trouble.—Prof. Shelton.

That Geological Survey.

The Osage County Chronicle, in calling attention to our article upon the geological survey, makes some very sensible remarks, to the effect that the survey should be encouraged only if it appears that practical benefits are to follow; and calls upon me to fortify my position by publishing "the scheme of the proposed survey, including the expense account."

Of course, it is not expected that I can give more than an approximate estimate of the expenditure; and this would depend entirely upon the character of the survey as regards minuteness of detail. The scheme of the survey—when we have one—will be prepared by the Legislature, or by the commissioners appointed for the purpose of conducting the work. But the advocates of this measure are practical men. They see that the resources of the State will be de-

veloped sooner; that it is a producer, not a consumer; that the expense of the survey would be largely met by the money that our people are now paying for private investigations, in the endeavor to discover hidden wealth, coal, ores, clay, salt, etc. But it rarely happens that the farmer, or other land-owner, profits by these investigations, as they are not made public. They serve to guide the speculator, who has possession of the facts; and the land-holder is placed at his mercy, selling his land at its value for agricultural purposes.

The survey should be from an economic point of view; and, to obtain the best practical results, a thorough examination of the geological formations in the State should be made, including the order, extent, thickness, dip and number, of strata, and the valuable minerals they contain, such as coal, metallic ores, building stone, flagging stone, fire clay, gypsum, hydraulic limestones, mineral springs, salt springs and marshes, gas springs and wells. Specimens of all these should be secured and correctly labelled. The quantity of the deposit should be ascertained, and quality determined, by accurate analyses and tests. These analyses would show, for example in the case of coal, the per cent of combustible matters, and the amount of gas and of coke afforded by its distillation; the proportion of magnesian carbonate in magnesian limestones; the value of fertilizing minerals, if such be found; the strength and quality of brines; etc.

There should also be a classification of the various soils of the State according to the physical and chemical qualities, as determined by accurate analyses, with a view to discover the most beneficial modes of cultivation, as affecting deportment towards moisture, air, and heat, and the best means of preserving fertility.

The distribution of plants and animals should be noted. Considerable has already been done by individual effort in the way of cataloguing the flora of our State; but the botanical portion of the survey would have to do especially with the limitation of these plants by climate, soil and elevation, and the determination of their qualities and characters, for comparison with those growing elsewhere.

The fossils in the different strata should receive due consideration,—not primarily to trace the succession of life through the geological ages, but to afford the best means of determining the relations and distribution of strata. In fact, no other evidence is unvarying and positive in fixing the identity of a formation. For economy of time and money alone, the fossils should be carefully studied. Neglecting the fossils, it is an almost interminable task to trace and identify the strata by their occasional outcrops. The life of an epoch serves the paleontologist as a label on the rocks of that epoch. The lithologist finds no such constant characters. By knowing the place in geological history of a formation, the probability, and often the possibility, of its containing valuable mineral deposits is known beforehand.

After all these data are obtained for limited areas, they must be combined, to form one connected whole, and published for the information and guidance of our people. We need not be at great expense to prepare fine cuts of fossil coral, impressions of leaves, etc.; but large and accurate geological maps should find a place in the reports. The details of the method of obtaining the above data will vary somewhat in different localities with the work to be done, and must be wrought out by the chief geologist, or by the geological commission. To this end, a

preliminary survey should be made; and, for this work, the next Legislature should make provision. The details would be worked up subsequently.

The Kansas Academy of Science, at its last meeting, early in the month just past, favored the survey, and appointed a committee to urge the matter before the Legislature. Since the subject will be brought before the Legislature, will the Chronicle still favor the survey, and work to make it what it should be,—a means of bringing more money into the treasury than it takes out, by aiding both the industrial and business classes of our citizens,—a survey of our mineral and our agricultural resources?—Prof. Failyer.

The Dog Tax.

The Manhattan INDUSTRIALIST reproduced our interview with Levi Empie on the sheep question, and the suggestion that the New York dog law be adopted in this State. Since that paragraph was penned, we have conversed with a gentleman from New York, who brought a flock of sheep; and he believes the adoption of the law in Kansas would add millions of dollars to the wealth of the State. In New York, the county government is in the hands of a board of supervisors—one for each township. A general tax is levied upon dogs,—two dollars for dogs and three for sluts. A farmer'ssing sheep by dogs immediately notifies the supervisor of his township; and that officer, after examination, issues his warrant for the amount, to be paid from the dog fund. In Kansas the farmers must find the owner of the dog, and recover through a slow process of the courts. The matter certainly deserves attention. No State in the Union is better adapted to sheep-raising, and yet how few flocks we have. In 1870, the number of sheep was 109,088. In 1873, the number was only 51,116. In 1875, 84,838; and in 1876, 143,962.—Osage Chronicle.

Shortly after the close of the war, a law similar to the above was enacted by the Legislature of the State of Michigan; and this act remained on the statute books for a number of years. Perhaps it has not been repealed as yet. This law, however, had some onerous provisions, which made it a dead-letter from the start. For example, the owner of every licensed dog was compelled to provide his canine with a collar bearing the name of the owner; and the tax was considerably higher than that levied by the New York law.

Our Legislature, in planning a dog law for Kansas, will do well to avoid mistakes of this kind. What is wanted is a law that imposes a tax that the owner of a worthless cur will not pay, but which will not prove too great a burden to owners of really valuable dogs. Of course, the penalty for the non-payment of the tax should be prompt destruction of the unlicensed brute. The provisions of the New York act referred to above, seem to us to be eminently reasonable; and we can only suggest a single amendment, which we frankly confess we are not certain would be practicable. Instead of the party who sustains damage in his flock from ravages of dogs, getting his remuneration from a dog fund, which often would have no existence, why not let his claim be paid directly from the county treasury? This would impress upon every taxpayer the importance of seeing that the dog law was enforced. As long as the payment of the injured sheep-owner was contingent upon the existence of this "dog fund," the chances, either for his payment or the destruction of worthless dogs, which after all is the principal object of the law, would seem to be not particularly good.

Kansas must be a great wool-growing State; but before she can be this, something must be done to rid the State of its superabundance of villainous curs,—the worst the

world has ever seen, we firmly believe. We are glad to notice that intelligent legislators like Mr. Rastall, of the Chronicle, are already moving in a matter of so much importance as is this to their rural constituents.—Prof. Shelton.

Educational Gossip.

The teachers of Garnett have organized a reading club, and have commenced Macaulay's History of England.

The annual meeting of the State Grange of Kansas will be held at Olathe, Johnson county, December 21st, 1880.

Harlan is going to have a college. It will be conducted by the United Brethren denomination of northern Kansas.

The public schools of Council Grove have had to be closed for the want of coal; and there is a coal famine along the Kansas Pacific. There is plenty of coal.

Prof. Boyle was elected county superintendent of Marion county, as an independent candidate; being the only independent candidate elected in that county.

Chas. E. Faulkner, of Salina, who is a member of the State Board of Charities, writes to the Commonwealth an article urging the establishment of a State Industrial Reformatory.

There are quite a number of schools in the county that have not been able to secure teachers, from one cause or another. It strikes us that the day of twenty-five dollars teachers has about passed away.—Sumner County Press.

The Galena Republican says: "It is astonishing how many children there are growing up in this city, spending their time scrapping mineral instead of going to school. Here is a good field for some of our patriotic citizens of both sexes."

The fourteenth annual meeting of the Kansas Horticultural Society will be held at Wyandotte, on Tuesday, Wednesday, and Thursday, December 14, 15, and 16. County and local horticultural societies are requested to send one or more delegates.

After speaking of the inefficiency of the present school superintendents of Kansas, as a class, the Eureka Herald moves that the six thousand teachers of Kansas unite in asking the next Legislature to so amend our school laws, that no person will be eligible to the office of county superintendent who has not received a certificate from the State Board of Examiners.

It is a burning shame for any woman to gad about town, dressed in nice warm clothes, while her children go shivering on their way to school, hungry and half-clad in ragged trousers and thin summer clothes. No woman with a spark of humanity or christianity about her, will neglect her offspring in this way. Step-mothers are sometimes guilty of such things; but it is doubly disgraceful for a real mother to do so.—Eldorado Democrat.

The State University is in luck. A Mr. Spooner, of Boston, who is reported to be worth half a million, died recently, and made it one of two residuary legatees; the other being the Oberlin College, of Ohio. His special bequests only amount to about \$50,000, and thus leaves a handsome sum to both colleges. Mr. Spooner was an uncle of Prof. F. H. Snow; and it is to this relationship, no doubt, that the University owes its good luck. It is not yet known how soon the money will be available, or as to the exact amount that will fall to the Lawrence University.

Mr. S. H. Kilgore, we are informed, has resigned his position as a teacher of the intermediate department of our school. The reason assigned is said to be inability to preserve order in his department. It is a significant fact, that he succeeded a teacher who resigned her position for the same reason. There is no question of Mr. Kilgore's ability to teach. He is a gentleman of education and experience, and has a reputation as a teacher that is enviable. Miss Armour, who preceded him, has given satisfaction as a teacher, both before and since. We do not believe that these repeated failures in this room are the fault of the teachers. The department is composed largely of boys and youths from ten to seventeen years of age, many of whom, from what we can learn, have taken great interest in seeing how badly they could demoralize the teacher, without committing any act of serious insubordination.—Hutchinson News.

THE INDUSTRIALIST.

SATURDAY, DECEMBER 4, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

Mr. Marshrole, principal of one of the Philadelphia high schools, gave us a pleasant call last evening.

The Mechanical Department is making a set of two dozen drawing-boards, for the classes in technical drawing.

The *Enterprise* says that an old College student by the name of Rose is now route agent on the M. & A. B. Railroad.

Dr. Franklin B. Hough, of Lewis county, N. Y., a well-known authority on forestry questions, visited the College on yesterday.

The primary classes in drawing are at present copying line ornaments from the black-board, upon tablets,—a beneficial and delightful exercise.

Hon. Geo. W. Martin, State Printer, presents the College Library a copy of "The Northern Tier," written by Hon. E. J. Jenkins, Concordia, Kansas.

The College Library is indebted to Judge Halderman, United States Consul at Bangkok, Siam, for a copy of a Siamese journal in the "original tongues."

The Japan *Gazette*, an English newspaper printed at Yokohama, Japan, is kept on file in the Library. The latest number, received last evening, bears date of November 8th.

Mr. C. R. Underwood, proprietor of the Salina Mills, Salina, Kansas, was at the College on Thursday, when he purchased the Berkshire boar "Gil Blas," which has been in use on the College Farm for two years past.

Prof. A. J. Cook and family took leave of their many friends hereabouts on Monday; and set their faces in the direction of their home, at Lansing, Mich. The Professor promises us that this shall not be his last visit to Kansas.

Last week the Managing Editor, being in the "agonies of composition," left the INDUSTRIALIST to take care of itself; which it seems to have done in good shape. Profs. Ward and Walters came nobly to the rescue; and the M. E. aforementioned tenders these gentlemen his hearty thanks for the kindness.

The following names have been added to the list of students since last published: J. A. Cooper, W. E. Cooper, and X. A. Gibbs, Wildcat, Riley; Chas. Messenger, Winfield, Cowley; Mary E. Moses, Carrie Williston, and W. E. Whaley, Manhattan, Riley; Grant Selby, Garnett, Anderson; A. E. Smith, Washington, Washington. These make the total number enrolled this term, 214.

The December meeting of the Scientific Club proved an interesting one. Mr. S. C. Mason read a paper on "Home Paleontology,"—speaking especially of the fossiliferous remains found in Bluemont,—which was quite interesting. Mr. Wm. Ulrich presented the widely interesting subject, "The Isthmus Ship Railway," in good style. Prof. Walters then gave us "The Metric System" in all its bearings. After Prof. Walters' speech, the Club seemed unanimously of the opinion that the metric system could be adopted by the Government with great advantage and but little trouble and expense. The following members were assigned duties for the January meeting: Prof. Ward, Prof. Popenoe, Mr. Knaus, and Mr. Allen. Adjourned.

QUINQUEFOLIA.

We are pained to learn of the death of Capt. Ambrose Todd, who departed this life at 4 A. M. this morning, after a sickness of four days. Capt. Todd is an old resident of Manhattan, and his life here has been of great usefulness from the first.

From 1871 to 1878, he was Sup't of the Mechanical Department of this College; and much of the present standing and usefulness of this department is due to his untiring energy. Capt. Todd was a very useful man in a wide field of labor; he being a skillful workman in nearly all branches of wood and iron work. For two years past, he has been engaged in the nursery business, in which he has attained a good degree of success. In his church, in his business, and by his neighbors, Capt. Todd will be greatly missed. He leaves a widow and two sons, one of whom, a graduate of this College and of West Point Military Academy, is now a Lieutenant of Artillery in the U. S. Army.

SOCIETY HALL, Dec. 3d, 1880.

A large number of Alpha Betas assembled in the Hall, after the lecture in Chapel by Prof. Shelton. The music by the committee was fine. The new method of preparing questions for extemporaneous speaking has proved to be a saving of time. Mr. Pence presented the first half of the *Gleaner*. It was full of wit and wisdom. The second half was presented by Miss Pope; and, as was expected, it bore marks of being prepared by one accustomed to the work. She has had an experience of forty years in the editorial chair.

The Society was surprised and pleased when the Secretary read a communication inviting the Society to Prof. Platt's for a social. The Society accepted the invitation, and tendered a vote of thanks to Prof. Platt for it. As it was left with us to set the time, we decided to go Tuesday evening, Dec. 7th. A pleasant time is expected.

A. B. GRAPHEIN.

At the usual hour, Nov. 27th, 1880, the Hall was well filled, and the Webster exercises commenced. Mr. Leach opened the debate upon the question, "Resolved, That all lands given to railroad companies by the Government, for the construction of railroads, should fall back to the Government, if not sold within three years." He was supported by Mr. Marvin. The negative view of the question was presented by H. L. Call and J. C. Allen. This is one of the practical questions in which the Websters delight, and was ably handled upon both sides. Judges decided for the negative. Considerable time was consumed in extemporaneous speaking; after which the Society listened to a declamation by Mr. Brady, and a select reading by Mr. Palmer. Debate next week will be upon the question, "Resolved, That the negro children of this State should be educated in separate schools." This question is becoming a serious one, and the debate is sure to be a warm one.

SCRATCH-PAPER.

SPECIAL ADVANTAGES.

We enumerate a few of the special advantages which the Agricultural College presents to the young people of the State of Kansas:

First: Although an industrial school, as thorough and as complete an education—using the term in its popular sense—can be acquired here as in other schools. A student will make as rapid advancement here as elsewhere in the studies pursued, whether he remains here one or two years, or through the whole course.

Second: While obtaining a knowledge of English, mathematics, and the natural sciences, every student is learning some useful trade or art. This peculiar feature of the Agricultural College is a success. It should no longer be regarded as an experiment. Those who have been here one, two or three years are now in good positions, receiving good wages as telegraph operators, printers, carpenters, etc. Young men who have been through the course in practical agriculture and horticulture are rapidly becoming known as the best farmers in the localities in which they reside.

Third: The expenses are brought down to the lowest possible point. There are no matriculation fees, no tuition bills, no college customs which compel a useless expenditure for badges or dress. The expenses are simply the cost of living, and the text-books used.

Fourth: The high moral and religious influence which exists at Manhattan. The students of the Agricultural College are young men and women of excellent character. Their average age is about eighteen years. They are deeply in earnest in their efforts for advancement. Of course there are a few exceptions, but the vicious or shiftless are soon thrown out. "Attend to business or leave" is the rule. A wholesome religious influence pervades the Institution. The students' weekly prayer-meeting has been well sustained for more than ten years.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or

Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urgently advised to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00

Private lessons, 1 a week, on any instrument, .60

Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books,

under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. Wm. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

GEO. F. THOMPSON, President.

S. C. MASON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.

G. H. FAILYER, Secretary.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M. & A. B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

Long & Firestone, Livery, Feed and Sale
Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

Telegraphy.—The Telegraph Department is furnished with ample accommodations for acquiring a thorough knowledge of telegraphy. Daily instruction and drill by an experienced operator.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry, Photography and Household Chemistry.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Manhattan Bank.—E. B. Purcell, Banker
Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Agricultural College Lands.—These lands are in the market, as provided by law, and for sale for one-eighth cash, balance in seven equal annual payments with ten per cent interest, payable annually. The lands are all choice selections, and prices range generally from \$5.00 to \$6.25 per acre. Some of the best tracts are appraised at from \$8 to \$10 per acre, and they are well worth the money. These lands are located in Washington, Marshall, Clay, Riley and Dickinson counties. For particulars, maps and descriptions, address L. R. Elliott, Agent, Manhattan, Kas.

THE INDUSTRIALIST.

SATURDAY, DECEMBER 4, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered, in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Elliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefices and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP.

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE.

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE.

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this Line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

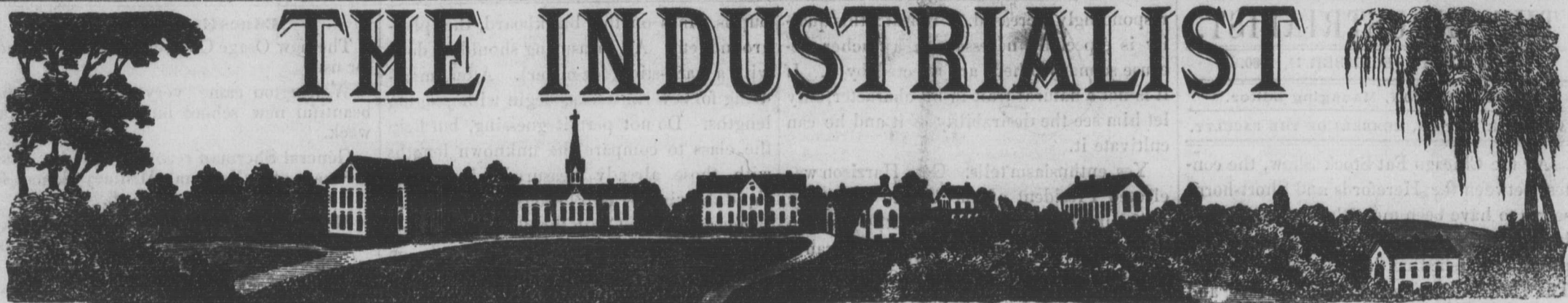
All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.



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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, ten, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Industrial Education.

In this nineteenth century, very many people seem to have gone crazy on the matter of education. Thousands of boys and girls think that if they take a course in an academy, or graduate in some higher institution, their fortune is made, and a long life of honor and happiness lies before them.

Now, an education to fit a man or woman for some of the real and active duties of life,—some trade, business or profession,—is an advantage. But many thousands want to get an education merely as some people want to "get religion," vainly thinking that the great end is then practically accomplished. Large numbers leave school, lay aside their acquired education, and, almost as helpless as infants, endeavor to get something to do. When they find that something, they must learn how to do it. The fashionable boarding-school miss, envied by her less fortunate sisters and cousins, returns to her old-fashioned home. She plays and sings divinely. She is courted and flattered, marries, knows all about the parlor and nothing about the kitchen and nursery. In a few years she is either broken in health, a discouraged woman, or a poor housekeeper, ready to pronounce life a failure.

So, too, with the boys who have not fitted themselves for the active duties of life, who have not had a definite, practical object in view. They may teach school as a last resort; or they may, with their delicate hands, secure clerkships, or possibly become book-keepers. The stout, hearty boys and girls, who never had more advantages than the district school affords, will far outstrip them, so far as real success and happiness in life are concerned. Aye, in usefulness too. In this abstract idea of education we are too often making a mistake in our advice and help to the colored race.

Professor N. M. Mitchell, of Alabama, is moving in the right direction in his endeavors to establish a manual-labor school for colored children. The intention is to teach in that school the trades, mechanic arts, agriculture, household duties, and the common branches of English.

If the colored people leave that school knowing how to read and write well, and how to do something and do it well, the results will be very satisfactory.

If those who do washing, housework, or any work which hired men and women are required to do, could do their work as they should do it, and as their employers desire them to do it, we would soon believe in the millennium.

Industrial education for those who expect to follow some industry, is our motto.—*Wyandotte Gazette*.

THE government owns 1,062,231,727 acres of unsurveyed lands. About 15,000,000 acres were sold during the last fiscal year; and the total of lands surveyed from the commencement of the survey, is 752,557,195 acres. The receipts for the last year were \$2,290,172.—*Exchange*.

THE Omaha *Republican* gives a detailed statement of this year's cattle drive, the total reaching 301,000. Of this number, about 50,000 head will be driven to the Union Pacific. About 25,000 horses are being driven up from Texas this season, of which number some 5,000 go to Nebraska.

FULLY 400,000 bushels of potatoes have been marketed in Davenport, Iowa, since the middle of August. These are shipped to all portions of the West,—Kansas and Nebraska, as well as Texas and Missouri and Arkansas, taking many car-loads. The average price has been thirty-five cents a bushel.—*Exchange*.

Old-Time Agricultural Work.

In New Mexico, can yet be seen the same agricultural methods and processes which prevailed two thousand years ago, in biblical times and lands. A recent writer describing these, says:

"The Mexican and Indian methods of harvesting their grain are very primitive, similar, indeed, to those of Eastern countries in Bible times. The wheat is cut by hand with a sickle, and taken, unbound, in carts to the threshing-floor. This consists of a round plat of level ground in an elevated place, fifty, one hundred, or two hundred feet in diameter, as the farm is a large or small one, the surface of which is pounded as hard as a cement floor. Around the edges of this, tall poles are set in the ground five or six feet apart, forming a circle. The unthreshed grain is piled up loosely in the center; and, when everything is ready, a thin layer is raked down between the central pile of grain and the circle of poles, and then a flock of goats or sheep, or sometimes of burros, or ponies, is driven around over the grain until it has all been beaten out of the heads by their feet. The straw is then thrown outside of the circle of poles, and the wheat pushed up toward the center. Another lot of the unthreshed grain is raked down, and the operation repeated until the whole is threshed.

I was forcibly reminded of the scriptural injunction which forbade the Hebrews to muzzle the ox that trod out the grain. The winnowing is also done in the biblical way. After the wheat has been separated from the straw, it is gathered up into a heap; and when a brisk breeze arises, it is thrown into the air in the teeth of the wind, which blows away the chaff, and the wheat falls by itself on the clean floor. At a distance, the flying chaff looks like steam escaping; by successive puffs, from the exhaust-pipe of an engine.—*Lawrence Home Journal*.

The Peach.

The peach, which is now in season, originated in Persia and northern India; and is of the same genus as the almond. The nectarine differs from the peach only in being smooth, while the peach is downy. It is a mere variety probably produced and assuredly preserved, by cultivation. The freestone peach of the French is their *peche*, while the clingstone is their *pavie*. A remarkable variety, of Chinese origin, has the fruit compressed and flattened, with almost evergreen leaves. The peach is cultivated widely in southern Europe, in many parts of the East, in South America and Australia; though it has never, it is believed, attained the perfection of the fruit of the United States. New Jersey, Pennsylvania, Delaware, Maryland, and Ohio, raise superb peaches, and have often orchards containing from 20,000 to 25,000 trees. The quantity of dried peaches is reported to be steadily increasing, while peach brandy is diminishing. Peach water, obtained by bruising the leaves of the tree, mixing the pulp with water, and distilling, is not only employed for flavoring, but in medicine as a sedative and vermifuge. The stone of the fruit is much like the bitter almond in its properties, and the blossoms exhale an odor of bitter almonds. Both the stone and blossoms are used in the manufacture of a liquor called *persio*. In the old and new world, there are, it is said, more than one hundred varieties of the delicious fruit.—*New York Tribune*.

THERE are a few very poor people in this city. Who will lead off to help provide them with necessities during the cold weather? A Christmas dinner is well, but a blanket, coat or dress is better. Don't forget the latter while planning to furnish the former.—*Clay Center Localist*.

Our Exchanges.

Gen. McKenzie is expected at Fort Riley about the middle of the month.—*Junction City Union*.

L. C. Faris killed a bear the first of this week, close to Greever's camp, below the Cimarron.—*Medicine Lodge Cresset*.

The yield of the rice corn crop in this county for the current year, is reported from 50 to 65 bushels per acre.—*Wellington Press*.

A party of Medicine Lodge hunters returned last week from the Territory with one deer and sixty-seven turkeys. So says the *Index*.

The expense of the late election held in this county, for judges, clerks, and mileage, in making returns, amounts to \$457.50, or one mill less than eleven cents a vote for all the votes cast.—*Columbus Times*.

Responsible parties have informed us that they have ordered all the machinery necessary for ginning and baling cotton; and that said machinery will be here and ready for operation within a few days.—*Oswego Independent*.

On Wednesday, at 4 p. m., there was filed for record with the register of deeds of Franklin county, the Missouri Pacific Railway Company's consolidated first mortgage bonds to John F. Dillon, trustee. The mortgage is \$30,000,000, and covers all the Missouri Pacific Railway already built in Kansas and Missouri.—*Ottawa News*.

At least 35,000 head of sheep are held in the eastern part of Ford county; and we may estimate the number in the county at 40,000 head. This is a new industry sprung up within a year past, and, with the prospects, promises to increase largely. The sheep business will add greatly to the taxable wealth of the country.—*Dodge City Times*.

The prospects are brightening for a good railroad depot at Junction City. One is badly needed; and we understand that a little encouragement and material aid, in the form of labor of men and teams, and private subscriptions, will probably insure a solid stone building, creditable to the city, and ample for the trade and travel of the region.—*Tribune*.

If every farmer would, each fall or spring, set out trees along the line of his place, on the public highways, how fine the country would look in a few years. The cost would be only a trifle; and the value the trees would add to the farm would be many fold. Cottonwood or box-elder are as good for this purpose as any, and are pretty sure to grow.—*Sterling Bulletin*.

C. W. Childers, while digging for water to supply his sheep, on his farm on Rock Creek, in Cedar township, cut through a vein of coal, twelve to fourteen inches thick. Further investigation shows that the vein extends through a large tract of land. He immediately got out two loads of coal, which he sold at Cedar Vale for 25 cents per bushel. He has employed several hands, and will supply the whole section. Samples sent to us are an excellent article. We think he has a bonanza.—*Winfield Courier*.

Large iron pans, instead of kettles, are to be used at the Alma Salt Works hereafter. Mr. Wright, the manager, thoroughly understands his business, as he has fully demonstrated since the work came under his charge. There is in the wells an almost unlimited quantity of pure brine; and as much is pumped in three hours as can be evaporated in twenty-four hours, with the present facilities. But before spring we anticipate that a car-load of pure, white salt will leave these works every day, Sundays excepted.—*Alma News*.

THE INDUSTRIALIST.

SATURDAY, DECEMBER 11, 1880.

E. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

At the Chicago Fat Stock Show, the contest between the Herefords and Short-horns seems to have been more than usually spirited; and, as is usual in such cases, the result probably satisfied neither of the contestants. The Herefords are a very valuable race, and one that is rapidly rising in the estimation of the people. That they will give Short-horn breeders a good deal of trouble in the near future, there can be no doubt. The winnings of the two breeds at Chicago are as follows:—

SHORT-HORNS.

Grand Sweepstakes for the best steer or cow in the Show.

Best Cow of any age or breed.

Best Dressed Carcass 2 and under 3 years.

Car-load lots best 3-year-old, 2-year-old, and yearling grade steers.

HEREFORDS.

Best Steer three years and under four.

Best Steer two years and under three.

Best Steer one year and under two.

Best Dressed Carcass 3 years and under 4, and 1 year and under 2.

Enthusiasm.

This is the key to success in every occupation. The farmer who brings no enthusiasm to his profession, but merely performs his daily task because he is obliged to do something for a living, finds his labor a mere drudgery: his crops are only half tended, and of course bring him but meager returns. But let him bring a little enthusiasm to bear on his employment, with the resolution to raise a little better crops than he ever raised before, and he becomes interested in his labor. It is no longer a drudgery but a joy to engage in it; and his success is only measured by the degree of his well-directed enthusiasm.

The public speaker who has but a limited supply of this article, will find that he has made but little impression upon his hearers. He may have prepared his discourse very elaborately, his arguments may be ever so sound, and arranged with the greatest care as to method, yet, if he delivers it in a dull, prosy, monotonous manner, there will be few in his audience who will be at all benefited by what he has said. But let him be enthused with his subject, and let his tone and manner and modulation show that he feels and believes every word that he speaks, and he moves his audience,—he makes an impression upon them that is lasting. The majority of people's minds are so constituted that they will not work to follow an argument and draw conclusions from it, unless their attention is attracted and their minds roused up by a little animation. It has always been strange to me that so many public speakers did not read in the vacant expression upon the countenances of their audience, that their words simply went in at one ear and out at the other.

There is scarcely an avocation in life in which enthusiasm, coupled with good sense, is not necessary to the best success; but perhaps nowhere is it more essential than in the profession of teaching. The importance of this quality in a teacher is multiplied by the number of persons who are affected by it. Now, it is true that, if a teacher is slow, dull, and monotonous in his manner, his pupils will engage in their work in very much the same way; but, if he is interested, animated, and zealous in each particular science that he endeavors to teach, and in the manner of conducting his recitations, he imparts something of the same spirit to each of his pupils, and their progress in study and in the development of thought is cor-

respondingly increased. I repeat: this quality is especially necessary in a teacher, because so many others are affected by it. If it is not a natural trait in his character, only let him see the desirability of it and he can cultivate it.

Yes, enthusiasm tells. Gen. Harrison was elected President of the United States in 1840, simply by an unusual enthusiasm in the old Whig party. The temperance amendment to the constitution of Kansas in 1880, was carried by the enthusiasm of the temperance people; and so it is with any great or noble cause,—it is made successful if backed up by enthusiasm.

But let no one think that enthusiasm is the only element of success. He who undertakes to make up in bluster what he lacks in knowledge and good, hard, common sense, will make a miserable failure. He is only surrounding himself with a gauze so thin that even a child can see through it. But let him add enthusiasm to ability and good judgment, and he is sure of success.—*Prof. Platt.*

Drawing.

By request, I presented, at the State Teachers' Institute last winter, a plan of instruction in industrial drawing, for Kansas schools. The time allotted to this subject was short; and I was called from the rostrum before even the outline had been properly located. However, to judge from numerous requests for copies of the *Capital* or *North Topeka Times*, which published the fragmentary plan, it must have served as a starter, at least; and, in hope of producing further good in a greatly neglected field of education, I present it again, in substance.

Assuming that the young Kansan goes to school during six years, I divide the subject into six parts. During the first three years, the pupils draw on the slate, from figures placed on the blackboard by the teacher; and the remaining three years are given to the study of three small text-books, and occasional blackboard exercises. All exercises consist of lines "in the flat" except those of the sixth year, when object drawing is taken up.

First year.—Begin by drawing squares of various sizes. Bisect their sides. Draw their diameters. Draw oblongs of various proportions, with their diagonals and diameters. Introduce simple curves. Explain how these are drawn. Draw various figures based upon these simple lines,—Latin cross, gate, hat, shovel, Greek fret, ornaments, house-fronts, table with drawer, etc. Insist on clean slates and sharp pencils from the start. Do not expect too much. Explain the figures while you draw them. Avoid scientific terms, but give the popular names of all figures.—Five short lessons a week.

Second year.—Introduce the circle and compound curves. Trisect the sides and angles of squares; and draw figures based upon these new characters. The products of the pottery furnish good patterns. All figures must be based upon simple geometrical diagrams, with marked proportions. Request your pupils to draw large figures one day and small ones the next. Insist upon fine lines, sharp pencils, clean slates, and erect positions.—Two lessons a week.

Third year.—Draw abstract curves showing tangential connections. Explain balance and symmetry (by examples rather than definitions). Have your pupils draw on the blackboard at intervals. Capital letters inscribed within squares or oblong diagrams, will furnish good exercises; also, rosettes and conventional leaves. Begin with measuring: measure the school-room, desks,

pupils, lines on the blackboard, the playground, etc. All measuring should be done with a yard-stick (or meter). After measuring for several weeks, begin with judging lengths. Do not permit guessing, but help the class to compare the unknown lengths with those already measured. Encourage rapid drawing.—Two lessons a week.

Fourth year.—Cause the class to buy Prof. Walter Smith's intermediate text-books on Art Education No. 1. Insist on sharp pencils, clean lines, and clean books. All drawing must be done with Faber No. 5. Finish the book during the year: it contains twenty pages. Continue the measuring and judging exercises. Explain how angles are measured. Get a large ring protractor, form angles with the blackboard compasses, and measure them with it while the class is watching you. Form angles, and ask the class to judge their size. Mere guessing will soon give way to close judgment. Do not ask pupils to draw at home.—Two lessons a week.

Fifth year.—Take up book No. 2 of same work. Explain conventionalism. Speak of repetition. Point out some of the main reasons why one figure or object is beautiful and another ugly. Give memory exercises, by drawing figures on the blackboard and asking your pupils to reproduce them after you have erased them, or by requesting a few pupils every day to draw figures on the board that have already been drawn in the book.—Two lessons a week.

Sixth year.—Explain the difference between reality and perspective, and give simple mathematical rules on perspective. Take up book No. 3 of same work. Industrial drawing does not require extensive shading: do not attempt it. Seeing in the space is difficult: here pupils need constant, close watching. Select with much care the objects to be drawn on the blank pages of the book. Draw them on the blackboard for the class as often as time will permit, explaining the rules of perspective as they shape the angles of the different lines. Study the theory of perspective yourself; for no teacher can teach what he does not know. Walter Smith's three text-books on perspective, high-school course, will give you the needed instruction. There is no manual to these three books; but, if you know something of geometry, you will not be in need of a guide. Remember that drawing from nature and imagination is the end of the art, not copying.—Two lessons a week.

I do not advocate the use of text-books or printed tablets for the first three years. By drawing the original on the board, the teacher learns to draw, the pupils see how the figure is constructed, and all expenses are avoided,—three points of importance. The three small text-books for the advanced classes, cost only fifteen cents apiece. A "Teacher's Manual for Free-hand Drawing in Intermediate Schools," costing one dollar and twenty-five cents, has been issued by the same author, and will give needed information in regard to their use. Advanced pupils, after finishing the work laid out here, should begin with "Walter Smith's High-school Course," a work of equally great merits, consisting of sixteen text-books in geometrical, free-hand, perspective, and object drawing, accompanied by a teacher's manual.

The greatest obstacle to the introduction of drawing in our public schools is the want of confidence on the part of the teacher; and that can only be removed by a study of the subject, when it will be seen that there is nothing mysterious about it. Any information or suggestion that I can offer upon the subject will be cheerfully given.—*Prof. Walters.*

Educational Gossip.

The new Osage City school-house is ready for use.

Wellington came very near losing her beautiful new school building by fire last week.

General Sherman recommends the establishment of a National Military School for infantry, at Fort Leavenworth.

McPherson county has a lady who makes nearly every man swear that does business with her. She is a notary public.

Washington county has raised so much corn this year, and hands are so scarce, it will take till the last of January, 1881, to put it all in crib. On some of the bottom farms, as much as eighty bushels have been gathered to the acre, and when put into the market \$21.60 per acre.—*Washington Republican.*

We have received two school reports—and only two so far—that could be sent to the printer without being rewritten. We are willing to make a generous allowance for faulty punctuation; but when it comes to the perpetual misspelling of "Thomas" and "Clara," it is a little too much.—*Sumner County Press.*

It is a notorious fact that some of the teachers of this county are the worst penmen to be found. We flatter ourselves we can read almost anything that any one else can, but must confess that on several occasions, when we received letters from these teachers, it required fully a half-hour to decipher their "spider-tracks." Let the examining board pass an ordinance that no one can secure a certificate unless they at least write a fair hand. In our opinion, the school system of Miami county needs a general shaking up and polishing down; and, if some one will furnish the "music," we will do our part.—*Louisburg Chief.*

The McPherson *Republican* tells the following joke on the school board of Salina: "After much cogitation, agitation, perturbation, concentration, calculation, botheration and several other kinds of 'nation,' by the sorely vexed members of the school board, Salina succeeded in adopting a series of school-books, and rested in the serene hope that it had gotten rid of the book agent. But alas, among those books was a history; and along about campaign times some inquiring soul happened to read it, when, much to the disgust of all concerned, it was found that in the loyal and patriotic city of Salina they had adopted the veritable rebel edition of the history of the United States, which the stump-speakers were orating about; and now there is cussing in that city, and they are trying just as hard to get the book out as they did to get it adopted."

DR. HUGH GLENN, the foremost of California farmers, who this year has 45,000 acres in wheat, has 350,000 sacks ready, each capable of holding 140 pounds; and is afraid that these will not contain all his crop.

Mathematics.—Practical, direct and thorough drill in Arithmetic, Book-Keeping, Industrial Drawing, Algebra, Geometry, Trigonometry, Surveying, Mechanics and Engineering, Work in Field, with Tape Line, Chain, Compasses, Transit and Level. The course is shaped for the benefit of the farmer, mechanic, or business man, rather than for the benefit of the astronomer.

Special for Woman.—Courses of lectures on Household Economy, by Mrs. Cripps. Gardening, by Prof. Popenoe, treating of the vegetable, flower, commercial and ornamental. Household Chemistry, by Prof. Faijler, consisting of the chemistry of cooking, bread, tea and coffee, butter, cheese, dyeing and coloring, bleaching, disinfectants, ventilation, etc. Special Hygiene, by Mrs. Cripps.

Chemistry and Physics.—The most valuable and practical course in the West. Elementary Physics, Inorganic Chemistry, Organic Chemistry, Chemical Analysis, Agricultural Chemistry, Metallurgy, Chemical Physics, Meteorology, Pharmaceutical Chemistry. Photography and Household Chemistry.

Habits of Plants.—Thorough instruction in Vegetable Physiology; tracing the development of the root, stem, bud, leaf, flower and seed. Careful study of cereal grains, grasses, and other food-plants, and of native and foreign weeds. Special attention paid to the habits and best methods of preventing or destroying insects inimical to the Kansas Farmer.

Instrumental Music.—Instruction in instrumental music will be given in private lessons as formerly, and also in classes. The classes will be drilled after school hours, or at such times as are convenient to students. The number of students in each class, on piano or organ, is limited to three. Instruction will also be given on the various brass and orchestral instruments. Harmony, composition and instrumentation will be taught. For terms, see heading "Expenses" in article entitled, "The College Year."

THE INDUSTRIALIST.

SATURDAY, DECEMBER 11, 1880.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

The present term closes next Friday.

Prof. Walters goes about smiling. It is a b-hoy!

President Fairchild and Prof. Popenoe start for Wyandotte on Tuesday of next week, to attend the meeting of the State Horticultural Society.

The Parish Churchman is the name of a neat little three-column folio, printed at Independence, in the interest of the Protestant Episcopal Church.

It is suggested that Topeka erect a crematory "for the benefit of the whole State." Make it a crematory, with the view to benefiting the hotel buttry of the capital city, and we shall give consent.

We are under obligations to Prof. W. J. Beal for his very interesting and instructive report of experiments and the general work of the Horticultural Department of the Michigan State Agricultural College.

We rise and say with emphasis, that the heading of this sheet is the private property of this College. Webster never dreamed of an "industrialist." It was left to the fertile brain of ex-Pres. John A. Anderson to coin the powerful and yet melodious term. *Border Chief, N. B.!*

Shucking corn is the chief business on the farm this week. The corn and stalks are hauled directly to the barn; which, this raw weather, robs shucking of more than half of its terrors. Besides, we find that much greater progress is made by this method, than by shucking in the field.

A number of mistakes crept into our issue of last week, through the blundering of the intelligent compositor, of course. For instance, in "The Epizootic" article, "healthy" foods should have been "heating" foods; and, under "The Dog Tax," "statue" books mean "statute" books, every time.

Faculty and students unite in grateful acknowledgment of favors from all the leading railroads of the State, in excursion rates for the winter vacation, from Dec. 17th to Jan. 4th. Nearly one-half of the students will avail themselves of this opportunity to visit their homes at moderate cost.

We do not like to anticipate the results of an experiment not yet completed; but it is interesting to notice of our experiments in pig-feeding, now in the seventh week, that the pigs are giving twelve pounds of increase for every bushel of corn fed; which, at the present price of pork, markets our corn at just fifty cents per bushel.

During the winter term, there will be extra classes in Arithmetic, English, and Drawing, for such students as may enter not fully prepared for the second term's studies of the first year. Examinations for these classes will include Arithmetic to percentage, elements of English Grammar, Geography, Reading, Spelling, and Writing.

We acknowledge the receipt of a report of "Farm Experiments, by J. W. Sanborn, member from Belknap county, and Superintendent of the College Farm, Hanover." There is nothing in the heading of this report to indicate the State from which it comes; but, by putting this and that together, we infer that Hanover is in New Hampshire.

The winter term begins on the afternoon of Monday, January 3d, at which time examinations for admission will be held and assignments to classes will be made. Chapel exercises and classes will be as usual on Tuesday, January 4th, beginning at 8:30 A. M. Old students know the value of a prompt beginning, and new ones will soon discover the mistake in any delay.

The Alpha Beta Society was called to order, Nov. 10th, by President Lightfoot. The Secretary being absent, Miss Pope was appointed to fill vacancy. Debate was spirited on the question, "Resolved, That the young Kansan should follow farming for a living." Under miscellaneous business, a committee was appointed to investigate the best means of rechartering the Society. On motion, the Society decided to make this the last meeting of the term; so the *Gleaner* will be presented the first meeting of next term. **BONUS MATIN.**

The classes of the next term will be arranged as follows:—

First Hour.—Geology, Horticulture, English Structure, and English Drill.

Second Hour.—Trigonometry, Chemistry, and Book-keeping.

Third Hour.—Logic, Geometry, and United States History.

Fourth Hour.—Zoology, Chemistry, Practical Agriculture, English Structure.

Fifth Hour.—Household Economy and Chemistry alternating, and Arithmetic.

Drawing and industrial classes will be so arranged as to accommodate the students.

Manhattan has done a very handsome job of street improvement this summer; but the work done so far has not been exactly in the direction of our wishes. Now, gentlemen of the council, why not commence with the gravel from Poyntz Avenue to the school-house, either past the new Methodist or Congregational Church, and from thence proceed until the main entrance to the College grounds is reached? We expect to make considerable improvements in the College grounds within a year; but nothing would stimulate this work more than a handsome gravel drive between our main entrance and the city. It would be pretty certain to persuade the Board to continue it through the College grounds.

The December number of the *American Naturalist*, it is announced, will contain an article, "copiously illustrated," on the "Extinct Cats of America." We shall await the appearance of this number of the *Naturalist* with intense interest, feeling confident that this "leading article" will lead to the solution of one of the great problems of science. Reasoning *a priori*,—that surest road to truth in natural science,—it must be plain to the dullest intellect, that where the "extinct cat" is found there will also be numerous billets of wood, and boot-jacks, and possibly an occasional soap-dish; and that all will be found in the near neighborhood of a "back fence," we cannot for an instant doubt. Again, that a fossil bedroom window will be found near this back fence, opening upon it, we as surely believe as that the "extinct cat" was ever a live one. Fortunately, science disdains not the meanest object of study; and to it we commend this bedroom window, leaving it wide open, so to speak, feeling confident that near it will be found the prehistoric man, if not the "missing link" itself.

WEBSTER HALL, Dec. 4th, 1880.

The sudden and severe storm of last Saturday night did not prevent a goodly number of Websters from assembling. The usual opening exercises were followed by debate upon the question, "Resolved, That the negro children of this State should be educated in separate schools." The affirmative, represented by Mr. Calvin and Mr. Knaus, endeavored to show that the colored children were inferior to the white children in mental capacity, and that this fact, together with the existing prejudice against them, made it detrimental to both parties to educate the two together. Mr. Mason and Mr. Myers, on the negative, showed that the negro children in our schools are not inferior, mentally or morally, to many of the foreign white children. They claimed that mere difference of color should not be made a ground for separation, and that popular prejudice would die out with acquaintance, while separation would only increase it. It was also shown that while separate schools might be afforded in the large cities, in the rural districts it was wholly out of the question. Decision of the judges for the negative. After a half-hour spent in extemporaneous speaking, the Society was entertained with a declamation by Mr. Smith, which was unusually good. It was decided to change the order of exercises for next meeting, and a committee was appointed to arrange the same. This is the last meeting of the term, and a generally pleasant time may be expected. All are cordially urged to be present.

SCRATCH-PAPER.

The State Agricultural College of Kansas is in a more thriving condition than ever before, owing, as we believe, mainly to the influence and efforts of such men as President Fairchild, Professors Failyer and Popenoe, and others who are widely known as able scientists, and liberal-minded and progressive teachers.—*Kansas City Review of Science and Industry.*

Three hundred and eighty-five Indian youths are learning trades in the workshops at the various agencies. These are the roads to civilization. —*Enterprise.*

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00

Private lessons, 1 a week, on any instrument, .60

Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is

strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. **WM. J. LIGHTFOOT, President.**

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

GEO. F. THOMPSON, President.

S. C. MASON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.

G. H. FAILYER, Secretary.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37ff.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Turning, Scroll-Sawing, Blacksmithing and Painting.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Gardening for Profit.—Instruction and drill in Kansas Horticulture. The Nursery, Orchard, Vineyard, Vegetable Gardening, Flower and Landscape Gardening, and Kansas Forestry.

English Language.—The direct aim of the course is to make the student skillful in handling the machinery called language, just as an engineer handles his locomotive. Drill in English, History of English, Structure of English, Study of Words, and Rhetoric. Constant practice in the class room and, if desired, at the printer's cases.

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

Agricultural College Lands.—These lands are in the market, as provided by law, and for sale for one-eighth cash, balance in seven equal annual payments with ten per cent interest, payable annually. The lands are all choice selections, and prices range generally from \$5.00 to \$6.25 per acre. Some of the best tracts are appraised at from \$8 to \$10 per acre, and they are well worth the money. These lands are located in Washington, Marshall, Clay, Riley and Dickinson counties. For particulars, maps and descriptions, address L. R. Elliott, Agent, Manhattan, Kas.

THE INDUSTRIALIST.

SATURDAY, DECEMBER 11, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or House- hold Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.

Stems: Their derivation; their offices and properties; their relation to other parts of words.

Prefixes and Suffixes: The several sources whence derived; the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.

Compounds: Their value; their properties and uses; the laws governing their formation.

Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, to make one a master of his mother-tongue, a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know why given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying out fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department.

Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter time, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE,

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture. Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings. Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this Line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

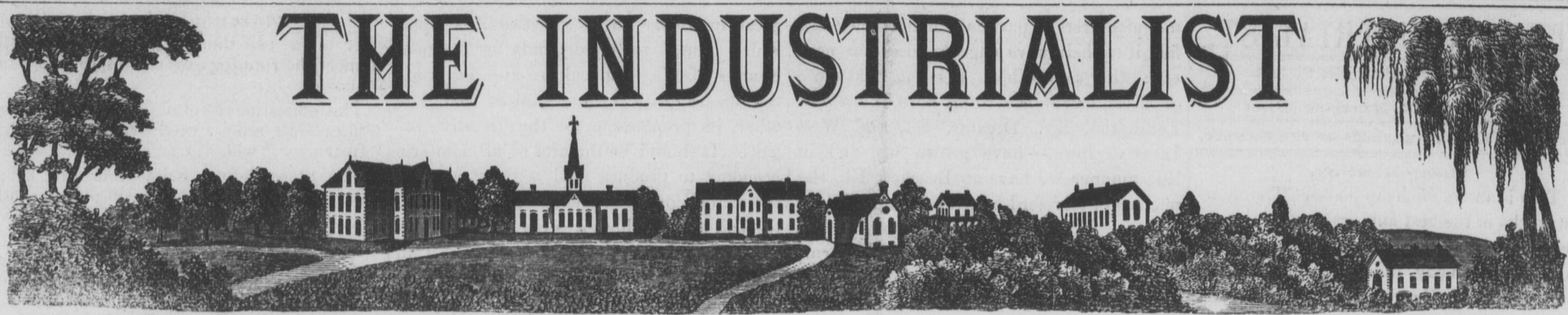
Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

Historical Society



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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN.

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN.

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Northern Pacific Coal Fields west of the Missouri.

From the best information we can obtain, one of the most extensive coal fields on the globe is located west of Missouri River, and along the line of the Northern Pacific R. R. The first outcropping of this deposit is about twenty-six miles west of Mandan, commonly called the Coal Banks; but, so far as prospected, only a three-foot vein has been struck. This vein is a lignite when first exposed, burning with a clear flame, developing somewhat in combustion the characteristics of cannel and bituminous, but not so good as the Pennsylvania or Ohio coal. This is the quality of all the coal, undoubtedly, in this whole region of country. Forty miles west of Mandan, is the extensive mine of Mr. E. H. Bly, proprietor of the Sheridan House, Bismarck, who prospected a large section of country on the line of the railroad last spring. This mine is a seven-foot vein, thirty feet below the level of the railroad grade, and dips about this distance in 400. Over this is a four-foot vein, and still another above this, corresponding with the level at the Coal Banks, of three feet. At Green River, 107 miles west of Mandan, is a monster vein of coal of thirteen feet. Mr. Bly, in his explorations, discovered numerous veins of coal from three to seven feet in thickness; and claims that anywhere in this great area in the bend of the Missouri, to and including the Bad Lands, on the same level, the same veins may be struck. On the south side of the Missouri River, near Fort Stevenson, a subterranean fire has been burning coal for years: even the Indians have no knowledge of how long; but, by report, extending far back, making these miniature Bad Lands like those west of the Green River, where fires are extinct. There is no doubt that the so-called Bad Lands were underlain with extensive layers of coal; and that, upon burning out, the surface settled down, leaving the peculiar characteristics which constitute their present formation. This is, at least, the accepted theory with those who have seen the process going on in northern Dakota. The question of coal for fuel, for all ages to come, and at cheap rates too, for the treeless prairies of the Great Northwest, is settled,—and permanently settled. There is enough for all. Mr. Bly has already contracted to get out 25,000 tons the coming season. These coal lands can be purchased of the Government at \$20 per acre; and the railroad company will sell at the same price. One thing is certain, that no one man or company can ever monopolize the business. There is too much of it. There will be coal on every 160 acres, for 200 miles west and 200 miles south of the Missouri River,—in western Dakota.—Bismarck Tribune.

Accepting the Situation.

The liquor dealers in the southern part of the State seem to be accepting the result of the adoption of the prohibitory amendment, with commendable good sense; and we think this will soon be the case generally. As a rule, the better class of liquor dealers are law-abiding citizens, and will respect such enactments as may be thought best by a majority of the people. Now that liquor-selling is placed under the ban of the law, they will adopt some other calling that is lawful, and probably about as profitable.

At Winfield, the saloons were notified to close or they would be prosecuted; and, after holding a meeting, their owners decided to close.

In Parsons, the largest liquor-house in southeastern Kansas has shut up; and the proprietors are in the pork-packing business.

The largest wholesale dealer in Fort Scott advertises that he will close out his business during the present month.—Valley Falls New Era.

The Poor of Kansas.

If any one has any idea, or can tell in figures anywhere near, the exact number of people in the western part of Kansas who are starving, he will do the State a great favor. If there is destitution to any great extent in any part of Kansas, we will guarantee that the more prosperous portions of the State do not know it, or they would contribute freely. If the people in the west need aid, why is it not made known, so that other sections of the State can help them? Kansas can, should, and will help her poor; and if a single human being in the State is allowed to starve, it will be a blot upon the fair fame and name of the most enterprising commonwealth in the Union.

In the meantime, notices come from all parts of the East that Kansas agents are there soliciting aid for the poor here; and very naturally the people and the papers of that section look askance and ask, "If Kansas is as prosperous as she pretends to be, as she says she is, why don't she take care of her own poor?" Kansas, who brags of her corn and wheat and stock and advancement and progress, is criminal if she allows the people of the East to feed her poor and starving; and, in order to preserve the good name of the State, we should see that all eastern agents are withdrawn at once, and that we ourselves attend to our destitute.—Leavenworth Times.

THE benefits of breeding and beauties of blood, are clearly shown in the following letter by J. L. Hopper, Laclede, Missouri, in Western Agriculturist:

"In regard to my sale, my cattle and the Cotswold sheep that were sold, went for a fair price: on all other cattle that were sold, it was a failure. I sold twenty-seven head of Short-horns, all Seventeens, for \$2,250, ranging in age from ten-year-old cows to eight-months' calves, making an average of \$83.33. I bred the whole herd, except two. They were raised and handled as cheap, and after the same style, as the commonest scrub cattle in the country; and that many scrub cattle, of the same gender and age, with the same treatment, would sell here to-day at an average of \$18, leaving a balance in favor of the Short-horns of \$65.33 per head, with the same care and expense. This proves clearly to my mind that breeding good stock pays, and they are now in the reach of every farmer; and the farmer that breeds to anything except a thoroughbred bull, is working against his own interest. If he has only two cows, the difference in the price of the first pair of calves will pay for a thoroughbred bull calf to breed from."

THE Daily Arkansas Gazette, of Little Rock, gives this explanation of the growth of the cotton-seed trade since the close of the war: "Before the war, the cotton seed was the means of constantly renewing our lands. It was the finest fertilizer in the world. So long as it was returned to the soil, the land was kept productive. After the war, it became a nuisance to the planter, because he could not control the labor to spread it upon his land. Hence, other uses for it were sought and found in the production of oil. Whether the change will prove a benefit to the country in the end or not, is a problem the future must solve. In the meantime, cotton-seed oil is becoming more and more important as an article of commerce.

RECENT experiments in England show that thin sowing of wheat in drill, is more productive than thick sowing. By special culture on small plots, a single grain to the hill has given a yield of 100 to 162 bushels to the acre, according to the Experiment Record.

Our Exchanges.

Mr. J. O. Graham, of the Harper county Times, took upon him the duties of married life, Dec. 1st, with Miss Eva Francis, of that county.

The Washington county Register says the chief business of the present term of court has been settling up horse trades and granting divorces.—Hanover Democrat.

The west wing of the State House is now entirely enclosed, and is full of carpenters and plasterers, who are using every effort to have it ready for the Legislature.—Capital.

A colored man from Kentucky, the only survivor of the Fort Pillow massacre, has purchased a section of land near Alma, for which he paid \$5,000.—Junction City Union.

The total wealth of the inhabitants of Greenwood county, is estimated to be \$2,467,006.48. The population of the county is 10,560, which shows the average wealth of the inhabitants to be \$233.31 per capita.—Madison News.

McPherson county has 105,000 acres of wheat sown, that has more favorable prospects for a heavy crop than on any previous year since the county was settled. In addition, there is a large acreage of volunteer wheat that looks well.—Exchange.

We are sorry to say that several of our citizens have the Oklahoma boom pretty badly. By the time they are fired out of the Territory by a company of Government troops, and a few red braves in full chase behind them, they will be willing to take Kansas in theirs.—Harper Times.

A stock company has been formed in Emporia, with H. C. Cross as president, S. B. Warren, secretary and treasurer, and P. B. Plumb, L. Severy, and C. Hood, board of directors, for the purpose of putting in gas works for Emporia. The organization is known as the Emporia Gas Company, and has a nominal capital of \$100,000.—Ledger.

A fine lot of fancy cattle is on exhibition at the Chicago stock-yards, and attracts great attention. It will be remembered that Sir James Grant purchased a vast tract of land in Kansas, and christened the central point, Victoria. He imported a breed of cattle known as polled Angus; and the lot mentioned above is the first which has reached the Chicago market. There are thirty-six head of black, high-grade steers, fattened in Missouri, weighing about 1,400 pounds each; and an offer of \$5.60 for them was refused.—Champion.

Several fires in this vicinity have lately originated from coal-oil lamps. So far, no great damage has been done; but how long this good luck will continue, is uncertain. The coal oil seems to be at fault in most cases. They are shipping the most miserable stuff out here; and our dealers have no means of testing it and cannot help themselves. There ought to be a stringent law on the subject. Good coal oil properly made ready for use, will not burn any more easily than lard oil. If a lamp falls and breaks, when filled with such oil, it goes out. The oil sold in all the States where there is no law on the matter, is little better than gunpowder to handle. The merchants in town are doing their best to get a good article; and the law ought to come to their aid.—McPherson Republican.

PROF. MARKS, of Philadelphia, stated, at a recent meeting of the Franklin Institute, that he had made some calculations of the maximum speed at which locomotives could be driven, before the centrifugal force on the tires of the driving wheels would become so great as to cause them to burst. These calculations, which were approximate only, showed that the limit of speed was in the neighborhood of 150 miles per hour.—Exchange.

THE INDUSTRIALIST.

SATURDAY, DECEMBER 18, 1880.

H. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Cheap Reading.

This is an era of cheap books. The choicest works of the best authors are within the reach of every one. You can buy more books for \$5 to-day, than you could for \$25 two years ago. Every young person should begin to collect a library, at once. It matters little what your tastes may be, you can gratify them. You can get a play of Shakspeare, or the Pilgrim's Progress, or a Sunday-school book, for a nickel each. For three nickels, you can buy several essays of Macaulay, a scientific treatise by Huxley or Bain, or a standard novel. The price of half-a-dozen cigars will purchase a history or a volume of poetry; and an encyclopedia costs no more than a pair of boots. A fine collection of poems costs no more than a pound of candy. The proceeds of a load of corn or a fat hog, will buy reading for a family for six months. To-day, books and papers are the cheapest furniture you can put in your house. The change from tallow dips to kerosene 175° proof, is not so great as the change in the price of choice reading in our day. In our younger days, it was only the trashy French novel that could be had for twenty-five cents. Now the "best is the cheapest," literally; and the standard works are supplanting the vile and worthless. Is it the dawn of the millennium? — Prof. Ward.

More Breeds of Cattle.

Referring to the success of the Herefords at the late Fat-stock Show, held at Chicago, the *Nationalist* of this week says: "The latter breed is fast coming in favor; and some of our own breeders would do well to make a speciality of them. Our stockmen have devoted themselves too exclusively to Short-horns." We are not quite sure what the writer means in the above quotation. He evidently means one of two things: either that "our own breeders" shall abandon the particular breed which they now cultivate and make a "speciality" of Herefords, they having "devoted themselves too exclusively to Short-horns;" or, that they shall in future cultivate mixed herds of Short-horns and Herefords. But whichever idea is intended, we care not: either plan is bad policy, and all the facts are against it.

In the first place, the man who abandons Short-horns for Herefords, or Herefords for Short-horns, practically commences breeding afresh, and encounters all the difficulties that beset the new beginner. He knows next to nothing of the habits, history, and proper management of the new breed; and all his study and experience with the old counts him little, or nothing at all. Of course, great prospective advantages may warrant the encountering of these difficulties; but, in changing from Short-horns to Herefords, are any such overpowering advantages to be expected?

But this is not all. The introducer of the new breed, after his herd has been fairly established, will encounter difficulties of another kind, from the start: he will have few or no interests in common with the neighboring breeders of Short-horns; in fact, he will live among relentless enemies, who will lose no opportunity to deride and belittle his work: he can make no exchanges in the use of sires; and he will get none of the benefits of the gratuitous advertising which a number of herds of one breed always secures. It is for these reasons, chiefly, that the breeders of a certain class of stock, like

manufacturers of particular articles of goods, find it to their advantage to locate as near each other as possible. It is thus that those great centers of the Short-horn interest,—Lexington, Ky., Decatur, Ill., and West Liberty, Iowa,—have grown up; and in like manner we have at Beecher, Ill., the nucleus of Hereford breeding in the United States.

No neighborhood, and certainly no farm, needs a great variety of breeds; and, least of all, such breeds as Short-horns and Herefords, which occupy substantially the same place in the general farm economy, both being beef breeds of the largest size. As to keeping two or more breeds upon the same farm, this will be thought of seriously by no one, unless he has a very large capital, or, like Mr. Cochran, of Canada, who has recently "gone into Herefords," he is a cattle dealer rather than breeder. Few men have the means or ability to work their will on a single breed, to say nothing of two.—Prof. Shelton.

Industrial Training.

The Report of the Commissioner of Education for 1878, just received, devotes several pages to industrial training and industrial education in this country. In previous reports, the information under this head has chiefly referred to foreign countries.

Besides the land-grant colleges and scientific schools, the names of fifty industrial schools are given, all of which have been established during the last twenty-five years. These schools are sustained by private individuals, or by religious denominations. The establishment of these schools shows that the public school does not fully meet the demands of the age.

We learn from the report that a few cities have made efforts to incorporate industrial training into the public-school system.

In Boston, the girls in the fourth, fifth, and sixth classes of the grammar school, receive instruction each week in sewing. The students are required to bring work from home. Though conducted under great disadvantages, the experiment is pronounced "reasonably satisfactory."

In the public schools of Providence, R. I., "sewing has been taught for several years, with great advantage to the girls receiving instruction, and without detriment to their usual studies." In 1876, it was found that 400 out of 600 girls in that city, who had received their first and last teaching in the use of the needle in the vacation schools in the summer of 1874, were each earning from \$4 to \$12 per week.

In Boston and in Philadelphia, successful attempts have been made to teach boys the use of tools while attending the public school. "It is believed that boys between the ages of ten and sixteen years can be successfully and economically taught the use of tools and the methods of working materials, and at the same time make the usual progress in their studies."

The report states that industrial drawing, "the most important experiment in the direction of technical training," is now taught in the schools of most of the large cities.

The cooking schools that have been established during the last few years in some of our large cities, are also noticed. In New York, during 1877-78, over 1,200 ladies received instruction in the New York school of cookery. In this connection, the Commissioner says: "The ninth census of the United States reported, that there were, in 1870, 7,589,000 families. These must, as a whole, have required a corresponding number of cooks. How many of these cooks had any reasonable knowledge of the elementary principles of the art, is a matter of

great interest. There are two arts upon which human society depends for the necessities of life,—agriculture and cooking: the one supplies the material of food; the other, its preparation for the digestive organs. It should be the aim of all domestic economy to produce food without wasting the nitrogenous ingredients of the soil, and to cook food without wasting its nutritious power, or injuring its sapid qualities. Can a judicious government entirely avoid encouraging these objects in suitable ways?"

Is not this last question pertinent? Does it not demand serious consideration? The production of food, and its preparation, interests every human being. In our States, probably three-fourths of the males are food producers; and a greater portion of the other sex have to do with its preparation. In what way can these objects be better encouraged and attained, than by making the production of food and the preparation of food a part of the course of study in our schools. At present, these subjects find a place in the curricula of but few institutions of learning. They both have a place in the course of study of this College; and the Commissioner compliments the management of this Institution by saying, that "the Kansas State Agricultural College is doing excellent work in this direction."

The existence of technical or industrial colleges implies preliminary courses of instruction, in secondary schools, in the various specialties of these colleges. These colleges in our country can never attain a high rank until this preliminary instruction is given in the preparatory schools. As nine-tenths of the people in every thriving community follow industrial pursuits, it would seem to be the sensible thing to shape the course of study in our public schools so that those who would become pre-eminent in industrial pursuits, might enter the technical colleges fully prepared to receive the benefits which they might confer.

That this matter is receiving increasing attention, is shown by comparing the relative increase, in this country, of literary colleges and universities, and of scientific institutions. During the last ten years, the increase of the former has been 34 per cent; while the latter has increased 250 per cent. The attendance at the former is 17 per cent greater than it was ten years ago; while, at the latter, it is 830 per cent. And yet it is a significant fact that, at the last report, in the former there were enrolled 57,987 students; while all the scientific colleges of the country, including the land-grant colleges, show an aggregate enrollment of only 13,153,—not one-fourth as many. The commercial and business colleges show an enrollment of 21,048.

We have no space to present the thoughts suggested by these figures. Apparently, practical education is not in favor. The great armies in the professions and in commerce, are to be kept full by new recruits. But we must recollect that in the last ten years great changes have been made in the courses of studies in the literary colleges. The sciences have been constantly encroaching upon the classics; while the mathematics have more than retained their former position. The education of to-day is more practical than it was ten years ago. What will the relative enrollment in these three classes of institutions be at the end of the next decade? Whatever it is, will depend, to a great extent, upon the bias given in the public schools to the youth of our country. In our opinion, it ought to be more towards industrial pursuits.—Prof. Ward.

Educational Gossip.

It takes two thousand dollars a month to meet the running expenses of the Topeka schools.

The educational column of the *Newton Golden Gate* reflects credit upon its editor, "Instructor," whoever he is.

The State Reform School building near North Topeka, is nearly completed; and the question now discussed is, Who shall be chief magistrate?

A. S. Barnes & Co. have sued the *Salina Herald* for \$25,000 for calling their United States history, in use in the public schools, a rebel history. Twenty-five thousand dollars will put a terrible crimp in the *Herald*.

An editor of a mathematical turn of mind, assumes that ten million of people have read President Hayes' message, and that it took each one an hour to get through with it. From this he shows that it took 416,666 days, or 1,141½ years, to read the message.

Prof. Schnebly, of Baldwin, a Representative from Douglas county, has prepared a bill which, should it become a law, would most effectually deliver the State from book agents in particular and many other evils in general. The bill provides for the printing of all necessary school-books by the State printing-office, at the expense of the State,—a plan followed by several countries in Europe.

School officers, be sure that your school-houses are comfortable. Children can not study with cold feet, neither can proper order and discipline be kept when the pupils are huddled around the stove trying in vain to keep warm. See that the foundations are "banked up;" that the floors are made close; that broken windows are repaired; and that the doors are well hung. Do this now. Don't put it off until next summer, hoping for a change in the weather. Prepare for a steady, long, cold winter. If we don't have it, your work won't be lost. —Winfield Courier.

How sad that "things aint like they used to was?" The following note came into our possession accidentally. It is a fair sample of notes received by teachers all over the land. This one was written on the back of a monthly report; and we presume the strictures it contains were called forth by the fact that the parent's pet received zero in composition, a foolish fandango evidently unknown in early days. This is the note reproduced: "anybody could teach a school as good as wellington afoards I dont see that my chiltern learn anything very sensible I am well aware when i went to school we did not have so many fool fandagos to through wewas taught moresensible thing."—*Sumner County Press*.

The Barton county children must all be like the youngster who was described as "a good little boy who never told lies, but who studied all day that he may become wise." At least we should judge so from a recent school report published in the *Great Bend Democrat*, wherein the entire roll of twenty-six pupils are marked 100 each. Pretty good standing for an entire school. We did hope that some little cus-tomer had snapped beans at the teacher and had his grade cut down, just to relieve the monotony of the thing; but no, 'twas a clean hundred each, from head to foot,—every urchin and urchiness perfect, with no choice in families, and therefore no grounds for jealousy.—*Golden Gate*.

The following is an illustration of pronunciation and spelling, in the use of wrong words, which, properly read, would sound right. The story: "A rite suite little buoy, the sun of a grate kernal, with a rough about his neck, flue up the rode swift as eh dear. After a thyme, he stopped at a gnu house and wrung the belle. His tow hurt hymn, and he kneaded wrest. He was two tired to raze his fare, pail face. A feint mown of pane rows from his lips. The made who herd the belle was about to pair a pare, but she through it down and ran with all her mite, for fear he guessed wood not weight. Butt when she saw the little won, tiers stood in her eyes at the site. "Ewe poor deer! Why dew yew lye hear? Are yew dyeing?" "Know," he said, "I am feint to the corps." She bore him inn her arms, as she aught, to a room where he mite bee quiet, gave him bred and meet, held cent under his knows, tide his choler, rapped him warmly, gave him some suite drachm from a viol, till at last he went fourth hail as a young horse. His eyes shown, his cheek was as read as a flour, and he gambled a hole our."

THE INDUSTRIALIST.

SATURDAY, DECEMBER 18, 1880

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

The Board of Regents will meet Wednesday, January 5th, 1881.

Prof. Walters will lecture before the teachers' institute at Salina, Dec. 27th. Subject, "Relations of Art and Industry."

Prof. Ward was in Kansas City on Tuesday last, on business connected with one of the Bismarck Grove meetings, next summer.

Several additions have been recently made to our exchange list. Among these are the Brookville Transcript and Mulvane Herald. Good papers, all.

We are glad to learn of the appointment of Hon. T. C. Henry as President of the State Fair Association. This means that the thing will go, if there is any go in it.

Messrs. W. A. and Clarence Wood, sons of Regent Wood, of Elmdale, paid the College a visit during the past week, inspecting all its departments. They seemed much pleased with what they saw. Call again.

The Western Agriculturist, the oldest and best farm monthly in the West, has the most practical premium we have seen, something that every farmer wants,—a Farm Account Book, sent free, post-paid, to every subscriber. Read the advertisement,—IT PAYS.

The Nationalist of this week announces that Prof. Hofer is soon to leave for the East, to spend the winter. This is altogether a mistake; and, as it is calculated to injure the Professor in his professional work, we hope the Nationalist will make the necessary correction.

We acknowledge the receipt of an invitation to be present, "with ladies," at the annual banquet of LaFayette Lodge, No. 16, A. F. & A. M., to be held at the Adams House, on Monday evening, Dec. 27th. Certain misgivings about "our figure," and the ravages of "rheumatiz," will prevent us from being present; but we trust that this will not have a dampening effect upon the "ball."

The Kansas and the Missouri State Horticultural Societies met in joint session this week at Wyandotte. We looked in upon them for a few minutes on Tuesday evening. The meeting promised to be one of great interest, as the prominent horticulturists of both States were present. Among them we noticed Prof. Gale, H. E. VanDeman, A. N. Godfrey, Col Colman, of the Rural World, and many others.

We lately received a circular headed with a most wonderful combination of botanical, pomological, entomological, and herpetological representatives, arranged in artistic manner. Nobody but a graduate of the Kansas State Agricultural College under its former President, could display such versatility of acquirements, on one small page, as has our friend, A. N. Godfrey, in his circular offering his services as civil engineer and surveyor.

On Saturday last, judging from the number of gay equipages, the rustling of silks, and the gorgeous panorama of millinery, seen on the grounds, that highly aristocratic gathering, "The Domestic Science Club," got down to business again. But we don't know anything about it: we only guess at this. We wish to say, however, that, unless we get a report from the next meeting of the D. S. C., (capitals, Mr. Printer,) signed by the Secretary, Corresponding Secretary, or the first deputy assistant, we shall, rather than take dishonorable means, post a short-hand reporter at every key-hole opening into the ladies' waiting-room, whenever an unusual number of handsome toilets are seen upon the grounds.

The Annual Report of the Commissioner of Education for 1878, comes to the INDUSTRIALIST under the frank of Hon. J. A. Anderson. It is a bulky volume of about 1,000 pages, packed full of information in regard to educational matters. As the Commissioner invites suggestions in the line of improvement, the INDUSTRIALIST would respectfully recommend that the footings of more of the items in the statistical tables, be given in the next report.

The Farm Department has this week succeeded in purchasing, at a nominal price, the high-bred Berkshire boar, "Royal Hopewell's Photograph,"—excuse the abominable name! This boar, in 1878, when six months old, won the sweepstakes prize at the Illinois State Fair; and shortly after was purchased by a party at Manhattan at a cost of \$230. He is of the "Hewer" blood, by imported "Royal Hopewell," the famous "Royal" winner; and, although not of great size, is wonderfully developed.

The College term which closed yesterday has been one of the best we have ever held. The attendance has been more regular than usual. Comparatively few who were enrolled left before the close of the term. Nearly all intend to return after the holidays. The number enrolled during the term was 214: males, 132; females, 82. The number of counties in Kansas represented was 41; number of other States, 3. There will be an increased attendance the next term. The need of more room is imperative.

This winter we are feeding, on the College farm, very little grain to the cattle. In fact, the only grain fed, is a small ration of bran to the calves and milch cows; all others subsisting entirely upon corn-stalks and hay, chiefly the former. Yet, the College herd has never done better: all our stock is in excellent "heart" and thick flesh; and the way they hold this shows very conclusively the great value of corn-fodder. The time is near at hand when farmers will shock their corn in the fall, and thus save this valuable fodder, as is generally done in the East.

The classes of the next term will be arranged as follows:—

First Year.—Geology, Horticulture, English Structure, and English Drill.

Second Year.—Trigonometry, Chemistry, and Book-keeping.

Third Year.—Logic, Geometry, and United States History.

Fourth Year.—Zoology, Chemistry, Practical Agriculture, English Structure.

Fifth Year.—Household Economy and Chemistry alternating, and Arithmetic.

Drawing and industrial classes will be so arranged as to accommodate the students.

The INDUSTRIALIST, in mentioning the names of the students of the State Agricultural College who hold positions in the various telegraph offices of the State, forgot to mention our young friend, H. C. Rushmore, Esq., who holds the position of station agent at Onaga, one of the most responsible and best paying positions on the Kansas Central. Harry is a graduate of the College, and a number one good fellow, as his many friends will testify. —Kansas Reporter.

In the item referred to by the Reporter, the aim was to give only the names of recent students of the Telegraph Department, who now occupy good positions. Had we undertaken to mention all the old students of this Institution who are leading honored and useful lives on Kansas farms and in Kansas shops and offices, we should have been compelled to issue an "extra" INDUSTRIALIST.

SOCIETY HALL, Dec. 11th, 1880.

This being the last meeting of the term, the hall was crowded, the audience numbering about one hundred. The committee on programme presented the following question for debate, "Resolved, That all American-born white women should have the right to vote." This was discussed by Messrs. Leach and Thompson upon the affirmative, and Knaus and Allen upon the negative. These names are sufficient to insure that the question was handled in a thorough and interesting manner. The judges decided unanimously for the affirmative. The Society then listened to excellent declamations by Mr. Call and Mr. Reeve. The usual five-minutes' recess was considerably extended; for, notwithstanding the "exclusive" character of the Society, a large number of ladies were present, and a general social time was indulged in. The house was again called to order to listen to the ever welcome Reporter, presented by Mr. Neiswender. The Society adjourned to meet January 8th, all parties feeling that they had spent a very pleasant evening.

SCRATCH-PAPER.

FARMERS' ALLIANCE.

At a mass meeting of the Butler county farmers, held Nov. 29th., the following resolutions, handed us by the Secretary, Mr. J. M. Foy, were adopted:—

Resolved, That it is the sense of this convention that the transportation question is paramount to all others, and we demand of our legislators and congressmen to use all honorable means to enact such legislation as will secure justice between

producers, shippers and transportation companies; and in our opinion the most practicable method of securing the above objects is by the appointment of commissioners, both State and National, similar to the commissioners provided by the laws of the State of Illinois.

Resolved, That this convention heartily endorse the action of the National Farmers' Alliance in their effort to accomplish the foregoing objects, and also to secure other needed reforms; and we hereby ask the favorable consideration of such Alliance by every citizen of this great commonwealth; and we pledge ourselves to aid the organization to the extent of our ability.

The Butler county convention also issues a call for a State convention, to be held in the city of Topeka, on Wednesday, the 12th day of January, 1881, for the purpose of considering the relation that railroads sustain to the people of this State and nation; and to adopt such measures as shall secure justice between producers, shippers and transportation companies, and to transact such other business as may come before it. All farmers' alliances, farmers' clubs, granges, and boards of trade, are requested to send delegates. All others interested in the development of our common country, are requested to be present. A State Alliance will be organized at the same time.

Prof. G. H. Failyer, of the State Agricultural College, replies to an article from this paper, on the proposed geological survey of the State, through the College paper, THE INDUSTRIALIST; which we reproduce in an other column. The Professor gives strong reasons for this survey, and hints at practical results. We believe if the University, the Agricultural College, the Academy of Science, and other institutions of learning in the State, press the matter, it will pass in the Legislature. Great care should be taken by the friends of the movement, that none but thoroughly competent men have charge of the matter, or have access to any appropriation made for the purpose. The first year's trial will settle the fate of the movement for many years to come.—Osage County Chronicle.

THE PRESENT COLLEGE YEAR.

After the summer vacation of three months, the College year opens with a term of fourteen weeks. The studies to be pursued are as follows:—

FALL TERM.

First Year.—Arithmetic. English Structure. Geometrical Drawing.

Second Year.—Algebra completed. Elementary Chemistry. Horticulture.

Third Year.—Geometry. Elementary Chemistry. Botany.

Fourth Year.—Agriculture or Hygiene. Meteorology. Psychology.

WINTER TERM.

First Year.—Book-keeping. English Analysis. U. S. History.

Second Year.—Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry and Mineralogy.

Third Year.—Trigonometry and Surveying, or Household Economy. Organic Chemistry and Mineralogy. Horticulture.

Fourth Year.—Logic. U. S. Constitution. Zoology.

SPRING TERM.

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Of these studies each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urged to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ADMISSION.

Candidates for admission at the beginning of the fall term, September 9th, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College.

EXPENSES.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure

books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .80
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

GENERAL DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, with organ accompaniment, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty. Occasional lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

Long & Firestone, Livery, Feed and Sale Stable, east end of Poyntz Avenue, Manhattan, Kansas. 5-37tf.

Mechanical Department.—Regular instruction and practice in Carpentry, Cabinet-Making, Scroll-Sawing, and Blacksmithing.

Bookseller and Stationer.—S. M. Fox, dealer in Fine Stationery, Pocket-Books, Envelopes, Gold Pens, Blank Books, etc. No. 127 Poyntz Avenue, Manhattan. 19-3m

Clothier.—Wm. Knostman, dealer in Ready Made Clothing, Hats, Caps, and Gents' Furnishing Goods. A well selected winter stock on hand. Opposite post-office, Manhattan. 11-26

Manhattan Bank.—E. B. Purcell, Banker; Jno. W. Webb, Cashier. A general banking business transacted. Bills of Exchange issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

It Pays to subscribe for the Western Agriculturist, the leading Agricultural Journal in the West, and get OUR FARM ACCOUNT BOOK FREE TO EVERY SUBSCRIBER, to keep complete accounts in figures without other writing, under special headings adapted to the farm for every day in the month and year; Stock-breeder's Record; &c. Endorsed by every farmer who sees it. Send for Specimen Copy and Premium List.

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THE INDUSTRIALIST.

SATURDAY, DECEMBER 18, 1880.

AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry, Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or Household Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.

Two courses of instruction, with practice in the field, are found in the second and fourth years. They include general principles of breeding; history and characteristics of breeds; adaptation of different breeds for special purposes and localities; implements of simple tillage; mechanical principles involved in their construction; action of the plow upon soil and subsoil; principles of draught; influence of different adjustments upon draught; use of the dynamometer; value of hoed crops in a system of husbandry; the cultivation of corn and roots; soils that need drainage; how to lay out a system of drains; house drainage; sewerage. General view of agriculture, ancient and modern; agricultural progress of the last century; relative advantages of mixed husbandry and special farming; the selection and arrangement of the farm with reference to the system to be pursued; rotation of crops; general advantages of rotation; the best rotation with reference to disposition of labor, production of manure, and extermination of weeds; pasturage and production of grain and forage crops; manures, how best housed and applied; composting manures; commercial fertilizers; systems of feeding; stall feeding; steaming food; soiling; experiments in feeding; farm buildings; farm-houses; barns.

BOTANY AND HORTICULTURE.

This department embraces a course of instruction in the elements of botany, structural and systematic, with a constant attention to the practical application of botany to the farm, orchard, garden, nursery and forest. The instruction is mainly given by lectures, accompanied by regular practical drill in all the work of the fruit, vegetable and flower gardens, nursery, orchard, vineyard and ornamental grounds. Later in the course, a closer examination of plant structure is undertaken, with the help of a compound microscope.

The lectures in Practical Horticulture embrace the following and kindred subjects: The relation of atmospheric motion, moisture and temperature to horticulture; seeds, the means of collecting and preserving; propagation, by seeds, cuttings, layers, suckers, grafting, budding; care of young plants; improvement of varieties; management of commercial and farm nursery; modes of pruning; the orchard fruit suitable for orchard and garden culture; the flower, vegetable and fruit garden; importance and mode of forest culture;

shelter belts and their influence; weeds and useful plants; noting the species of trees worthy of culture, either for profit or ornament.

LANDSCAPE GARDENING.

The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

CHEMISTRY AND PHYSICS.

INORGANIC CHEMISTRY.

This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially with regard to their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Eliot & Storer.

ORGANIC CHEMISTRY.

This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. Constantly accompanied by laboratory practice.

CHEMICAL ANALYSIS.

In this course each student is furnished his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.

This includes the study of the laws of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms a very important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

AGRICULTURAL CHEMISTRY.

This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

PHYSICS.

This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.

Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

HOUSEHOLD CHEMISTRY.

A course of lectures on this subject is yearly delivered to a class of young ladies. The course embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

SPECIAL COURSES

are always provided in Assaying, Pharmaceutical Chemistry and Photography.

ENGLISH LANGUAGE.

The course in English Grammar is intended to give a clear idea of the sentence in all its parts, and to require such practice in parsing and analysis as may give accuracy of expression.

Words are simply tools used to express ideas; and, since the vast majority of our communications are made by the employment of spoken or written words, skill in using them is as profitable to the industrialist as dexterity with the needle is profitable to the seamstress. The direct aim of the course is to make the student skillful and intelligent in handling the machinery called language, just as an engineer handles a locomotive; and no drill will be omitted, or effort spared, to gain this end. Apart from the course itself, which is far more practical and complete than that usually found in literary colleges, the constant attention given this subject by all the departments, and especially the practice required in the printing classes, affords superior advantages to the student.

ENGLISH ANALYSIS.

ELEMENTS OF WORDS.—The end aimed at in this study is to learn everything about words which will aid in their effective use. Among the topics included are:

Roots: What are they; their origin; their force and value as an element of language; the manner of their growth into different parts of speech.
Stems: Their derivation; their offices and properties; their relation to other parts of words.
Prefixes and Suffixes: The several sources whence derived; and the relation of their force or significance to those sources; explanation of the laws and principles governing their use along with stems.
Compounds: Their value; their formation and uses; the laws governing their formation.
Synonyms: Definitions; causes of their abundance in English; the principles to be observed in choosing among them, to express a thought.

Criticism: This constitutes a prominent part of the exercises of the pupil through his whole course in the study of English. It not only diversifies and enlivens the class-room exercise, but reduces to practice the principles of the structure of the language. By this means, the student acquires, not only a knowledge of English, but readiness and accuracy in speaking or writing it. The exercises in criticism embrace, not only examination of selected matter, but original composition.

ELEMENTS OF SENTENCES.—The purpose in view in studying this subject is not to traverse the ground gone over in the study of grammar, but to fix in the mind of the student a clear understanding and remembrance of names, the properties and offices of the several classes of words entering into an English sentence, by showing him the reason of things; to make more simple, as well as interesting and practically useful, a study otherwise "dry and unprofitable" in many cases, by explaining the reason of the verbal forms and changes, the rules and maxims he is to remember and observe in his use of language. In the same manner he is conducted through a study of the mutual relations and dependencies of the several elements making up a sentence.

COMPOSITION AND RHETORIC.

Systematic training in expression of thoughts upon paper, is accompanied by careful study of principles and methods, with those rules which help to make a neat and legible letter or document of any kind. A later course in Rhetoric gives the art of clear explanation, and convincing argument, with the general principles of sound criticism.

ENGLISH LITERATURE.—With a similar design, —to make one a master of his mother-tongue,—a course is given in the history of the English language and literature, with abundant illustrations by selections from the best authors. In this way pupils are led to appreciate the meaning of words and the art of expression, while they at the same time gain a slight acquaintance with the world of thinkers, who have been foremost in the advancement of knowledge.

Through such study, the College Library becomes a useful tool to the energetic student. Constant practice in expression of facts and thoughts gives readiness and correctness.

MATHEMATICS.

ARITHMETIC.

Figures and lines, like words, are only instruments with which to convey ideas, or perform operations that cannot be easily done without them. The arithmetical principles used in business are few and simple; but accuracy and rapidity in computation are only gained by practice. College graduates often fail to retain clerkships, not because they do not know *why* given operations are performed, but because they can neither add, multiply or divide with that habitual correctness which renders their work reliable.

The chief design of this study is to make the student expert in the use of numbers, as employed by the industrialist for profit. The occupation of a successful farmer demands the application of every principle of practical arithmetic, and is taken as a starting point, rather than that of an abstract system. Beginning with a simple cash account, book-keeping is gradually developed to the full extent of its real utility. The areas of fields, expense of crops, construction of houses, sales of produce, and investment of capital, involve all the fundamental operations, and those of profit and loss, commission, taxes, insurance, exchange and stocks. Accuracy of calculation and posting, rather than a mere comprehension of the principles, is aimed at.

BOOK-KEEPING

is a continuation of the above, having the same purpose and adopting such methods as the necessities of the class indicate. Thorough instruction in the principles and forms of business law is given. It will be seen that this method of teaching book-keeping, besides insuring arithmetical practice, develops practical skill in that important art.

DRAWING.

The practical value of Industrial Drawing can hardly be overestimated, first, because its study is the best drill for the development of the perceptive faculties, which are the ones most employed in daily life; and, second, because the working classes make a far greater use of lines than they do of figures. A farmer follows a line when laying a straight furrow; the carpenter uses the square and rule twenty times as often as he does figures; and a woman, in cutting a pattern, or deciding that one bonnet is prettier than another, does so by the line or "form." So that, either in its direct application, or in the exercise of that taste which comes from skill in using lines, this branch of mathematics is quite as important as a means of "mental discipline" as is the branch of computation, and is of far greater daily use. The admirable system of Prof. Walter Smith, Art Director of Massachusetts, is thoroughly followed through the grades of Free-hand, Geometrical, Object, Model, Perspective, Mechanical and Topographical Drawing, during the terms indicated by the Course of Study.

ALGEBRA.

Algebra is included in the course as a preparation for the study of Surveying and a help toward mastering the various problems of practical life in which quantity is an important item. It helps to make rules where none are given.

GEOMETRY.

Not one farmer in a thousand ever uses the transit in surveying his land, the testimony of the county surveyor being decisive in court; but every farmer makes countless applications of lines and angles in laying off fields, roads, gardens, planning houses, determining levels, etc. The object of Practical Geometry is to teach the properties and uses of angles, and to make the student skillful in the application of lines to the field by the uses of such simple instruments as are always within reach, or within his ability to construct; and accurate in the transferring of plans to the grounds, board or block.

SURVEYING.

The drill in the use of figures and lines given by the mathematical course as above indicated, renders the mastery of surveying an easy task. There is no calculation made or formula used by the working engineer which cannot be readily understood and performed by a skillful arithmetician, after proper instruction. The hand-book of the engineer is accordingly supplemented with a such special guidance as is found necessary for a full comprehension of the mathematical principles and their applications; and extended field practice is required in the use of the compass, level, transit and theodolite.

MECHANICS AND ENGINEERING.

A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a

single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

HISTORY AND PHILOSOPHY.

The elements of United States History are taught the first year, with especial reference to giving an understanding of the form and growth of the government under which we live.

An outline of general history in the third year, prepares the student to appreciate the world's progress in science, art and literature; and cultivates judgment in manners and morals.

Later in the course, a careful study of Political Economy, with illustrations from American experience, and a careful analysis of the United States Constitution, give a clearer insight into the ends and means of government, and their relation to the general welfare.

During the fourth year, the art of reasoning correctly is studied in systematic logic and principles of safe induction. This helps to clear perception and sound judgment,—the best business qualifications. Clear thinking and upright actions are also promoted by a study of the established principles of thought and action, in regard to thinking, feeling, and willing.

PHYSIOLOGY, ZOOLOGY, &c.

A term's study of the essential elements of human Anatomy and Physiology prepares the student to understand the principles of stock-breeding, and the classifications of Zoology. It also enables him to appreciate the general laws of health.

For the young ladies, a course of lectures in Special Hygiene is provided, later in the course. This course is given by Mrs. Cripps, the Superintendent of the Sewing and Cooking Department. Zoology is made one of the studies of the fourth year, for the purpose of instructing in such peculiarities of animal life as are needed to understand the world in which we live. For a similar purpose, a short course in Geology is included, with special attention to formation of soils, deposits of valuable minerals and general arrangement of the earth's crust.

Entomology is taught, especially with reference to insects injurious to farm crops, as well as to give a general knowledge of their structure and habits.

INDUSTRIALS.

In addition to the field practice in Agriculture and Horticulture, already mentioned, the College provides for instruction in some of the industrial arts.

THE CARPENTER SHOP,

under a competent superintendent, affords opportunity for all to learn the proper use and care of tools in ordinary work at the bench; while some become quite proficient in the plainer parts of cabinet-making. Some practice may also be had in painting and varnishing, and in fancy turning and scroll-sawing. The Blacksmith Shop gives training to a few in the elements of iron-working.

THE PRINTING-OFFICE,

where the INDUSTRIALIST is printed, permits those who choose to take the full course of instruction there to master the trade in all its essentials. To those who enter it for a shorter term, it gives excellent drill in language and general accuracy.

THE TELEGRAPH OFFICE,

with several miles of wire, and a half-dozen branch offices, is to some students a means of training for a necessary and profitable occupation, while getting an excellent general education. All essentials of general office-work are taught and practiced here.

SEWING AND COOKING

are taught by a competent instructress, in special lectures and daily practice.

Farming for Profit.—Special courses in Kansas Practical Agriculture, Simple Tillage, Farm Implements, Comparative Physiology, Stock Breeding, Mixed Husbandry, Rotation of Crops, Manures, Feeding, Buildings, Apparatus illustrating the course in Practical Agriculture.

Golden Belt Route.

The Kansas Division Union Pacific Railway

(formerly Kansas Pacific Railway), is the only line running its entire train to Denver; and arrives many hours in advance of all other lines from Kansas City or Leavenworth.

Denver is 114 miles nearer Kansas City by this Line than by any other.

The Denver Fast Express with Pullman Day Coaches and Sleepers, runs through to Denver in 32 hours. The Kansas Express Train leaves Kansas City at 11:00 every evening, and runs to Ellis, 302 miles West. The First-Class Coaches of this train are seated with the Celebrated Horton Reclining Chairs.

All persons en route to LEADVILLE, GUNNISON, EAGLE RIVER, TEN-MILE, SILVER CLIFF, THE SAN JUAN REGION, and all other mining points in Colorado, should go via the Kansas Division of the Union Pacific Railway.

All persons in poor health or seeking recreation, and all students of nature, should take this route to the delightful PARKS, and the wonderful CANYONS, the lofty MOUNTAINS, sparkling TROUT STREAMS, and MINERAL SPRINGS.

Thousands of acres yet to be opened to actual settlement under the Homestead Act, in Kansas; and the Kansas Pacific Railway has

62,500 Fine Farms

for sale at prices and on terms within the reach of all, and easily accessible to the great through line.

Write to S. J. Gilmore, Land Commissioner, Salina, Kansas, inclosing stamp for a copy of the "Kansas Pacific Homestead," and to Thos. L. Kimball, Gen'l Pass. and Ticket Agt., Kansas City, Mo., for the "Colorado Tourist," and "Illustrated Guide to the Rocky Mountains," and for such other information as you may desire concerning the mines and resorts of Colorado or the lands of Kansas.

THE INDUSTRIALIST



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KANSAS STATE AGRICULTURAL COLLEGE.

MANHATTAN, KANSAS.

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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

A Humorist's Advice.

There is a good deal of terse common-sense in these extracts from the *Hawk-eye's* advice to young men: "Remember, my son, you have to work. Whether you handle a pick or pen, a wheelbarrow or a set of books, digging ditches or editing a paper, ringing an auction bell or writing funny things, you must work. If you will look around you, you will see that the men who are the most able to work are the men who work the hardest."

"Don't be afraid of killing yourself with overwork, son. Men seldom work so hard as that on the sunny side of thirty. They die sometimes; but it is because they quit work at six P. M. and don't get home until two A. M. It's the intervals that kill, my son. The work gives you an appetite for your meals; it lends solidity to your slumbers; it gives you a perfect and grateful appreciation of a holiday."

"There are young men who do not work, my son; young men who make a living by sucking the end of a cane; who can tie a necktie in eleven different knots, and never lay a wrinkle in it; who can spend more money in a day than you can earn in a month, son; and who will go to the sheriff to buy a postal card, and apply at the office of the Street Commissioner for a marriage license."

"So find out what you want to be and to do, son, and take off your coat and make success in the world. The busier you are, the less vil you will be apt to get into, the sweeter will be your sleep, the brighter and happier your holidays, and the better satisfied will the world be with you."

Teachers' Salaries.

The total number of teachers employed in public schools in the United States and territories of the Union (Georgia and Idaho only, not reported), is 249,283. Most of the States and territories furnish full and accurate statistics; but Arkansas, while giving the total number of teachers, cannot tell how many are male and how many are female, nor their pay. Florida gives the number of teachers, male and female, but can give the pay of neither. The same is true of Kentucky, New York, and the territories of Dakota, New Mexico, and Wyoming. Texas estimates the number of teachers and gives their pay.

The United States Commissioner of Education presents a statement of the monthly compensation to teachers in public schools, with the remark that "any one who would examine the column of the average salaries paid, would not, from the nature of case the, expect the compensation of teachers to be the first point of attack, in the effort to retrench public expenses." The District of Columbia pays the highest salary to male teachers, \$120 per month. Arizona pays the highest salary to female teachers, \$90 per month. In the District of Columbia, in Nevada, and in Arizona, the average pay of male teachers is over \$100 per month. In California, it is \$85; in Massachusetts, \$84.78; in Rhode Island, \$81.49; in Montana, \$75; in Connecticut, New Jersey, Indiana, Colorado, and Ohio, it ranges from \$60 to \$67; in Utah, it is \$54; in Texas, \$53; in Michigan, Illinois, Iowa, Oregon, Wisconsin, New Hampshire, and Maryland, it ranges from \$41 to \$48; in Mississippi, Pennsylvania, Vermont, Nebraska, Maine, Virginia, West Virginia, Minnesota, Kansas, Tennessee, Louisiana, Delaware, South Carolina, Missouri, and North Carolina, from \$30 to \$40; and in Alabama, it is \$22. Next to Arizona, Nevada pays female teachers the highest average monthly salary, \$50; the District of Columbia stands next, \$49; California, \$48.16; Montana, \$47; Rhode Island, Indiana, Colorado, and Maryland,

\$41.40 to \$48; Connecticut, Massachusetts, New Jersey, Ohio, Illinois, Oregon, Pennsylvania, Nebraska, Virginia, West Virginia, Tennessee, and Louisiana, \$30 to \$37; Utah, Michigan, Iowa, Wisconsin, New Hampshire, Vermont, Minnesota, Kansas, South Carolina, North Carolina, and Alabama, \$22 to \$29; and Maine, \$17.04.

Alabama, Delaware, Mississippi, Missouri and Texas, do not report the pay of male and female teachers separately. It would have added to the interest and usefulness of these statistics if the commissioners who compiled them had also stated the cost of living in each State. It may be that the teacher in Kansas with \$30 per month is better off than the teacher in California with \$85. From other sources, it appears that New York City pays an average of \$814.17; and Philadelphia, an average of \$486.10. Boston comes first in the table of average salaries to principals of grammar schools, \$3,200 to male and \$2,000 to female. San Francisco pays \$2,466 to male and \$2,200 to female. But in the high schools, principals are paid \$4,000 in San Francisco and \$3,780 in Boston. Primary teachers are also best paid in San Francisco, receiving an average salary of \$1,500. Chicago ranks next with \$1,080; while Boston pays only \$800, and New York \$800, with Cleveland last in the list at \$546. Teachers in music get \$3,300 in Boston, and those in drawing the same; while in San Francisco \$1,950 is paid the one and \$2,100 the other. Cincinnati pays \$1,800 to both, and Chicago the same. A female teacher in drawing was engaged at Milwaukee recently for \$1,200; and one of the commissioners explained that "it is impossible to secure the services of a gentleman."—*Boston Transcript*.

THE man would deserve a public monument who should make every householder see and feel what forces of happiness lie hidden in the homeliest things. In Saintine's beautiful story of Picciola, the prisoner, wearing out weary days and nights, finds in a gillyflower that sprouts between the two flag-stones in the yard, a world of suggestion and delight. The whole argument for the wisdom and goodness of God is condensed into one poor weed. And, when taken at unawares, one is forced to see how exquisite is many an object that we commonly despise. A friend of ours presented a lady with a bouquet. In the center of it was a flower that she had never seen in a bouquet before. She thought it a gem of beauty. Where could he have found it? When she had sufficiently gone into raptures over it, he informed her that it was a potato blossom. And there is high authority for saying that a lily is arrayed as Solomon was not in all his glory. He is a poor artist who relies on a huge spread of canvas and a blaze of flashy colors. He is a poor novelist who depends on love scenes and murders to keep up the interests of his plot. And he is a poor soul, with a meager notion of the art of living, who can be happy only in a parade of wealth and show.—*The Advance*.

A VERY significant sentence was dropped in a recent discussion on improved school-keeping, by a sensible "layman":—

"We are doing all we can with our young lady teachers, as young ladies are now constituted." Until the people are willing to pay the money that will call to the school-rooms several hundred thousand teachers, gotten up on a different plan of life, with a different outlook from the present corps, it would only seem inhuman to demand anything in school work greatly in advance of our present achievement. As the average American teacher, male or female, "is now constituted," there must be a good deal of

machine work in teaching, a considerable amount of threshing children for discipline, and a good deal of mortifying failure in the preparation of our boys and girls for American citizenship. There is no doubt that the average teacher is fully up to the average man or woman in any walk of life, in fidelity, earnestness, and efficiency. But the melancholy fact is, that, as the average American citizen "is now constituted," we cannot expect the millennium just now.—*N. E. Journal of Education*.

Our Exchanges.

The Riley Centre *Independent* has enlarged to a five-column quarto, a fact we note with pleasure.

Wood and corn are in demand in Kirwin. Some of our citizens think that corn is cheaper at twenty-five cents a bushel than either wood or coal, for fuel.—*Chief*.

One hundred and seventy-five bushels of walnuts were shipped from Lawrence recently to Buffalo, Kansas. They are to be used in planting several timber claims in that vicinity.—*Exchange*.

The bee is said to be a resident of any climate of the globe. It will prosper in hollow trees in Canada, where mercury will freeze in the open air, as well as at the equator.—*Colman's Rural World*.

Mr. J. Rich, two miles north of Sabetha, last week harvested 950 bushels of corn from just ten acres of ground. We would like for any of our farmers who can beat this to hand in the item.—*Oneida Journal*.

McPherson has a broom factory in working order. The first broom was made on Tuesday of this week. This is a new undertaking in this town; and we are glad to see the Lincoln Bros. take hold of it.—*McPherson Republican*.

Forty head of Hereford bulls, for a few days past, have been in the yards of Lee & Reynolds. This firm intends sending them to their ranches south. The bulls are a fine lot of thoroughbreds. They are yearlings and two-year-olds.—*Dodge City Times*.

Wolves have become so numerous and daring that they have commenced making raids on the farmers' hogs. A. Leubke, northwest of town, had quite a large one killed the other night by these night prowlers. Can't we get up a wolf hunt? What say our sporting men?—*Hanover Democrat*.

The first shipment of cotton from Labette county was made last Saturday from Oswego, via the St. L. & S. F. to St. Louis, consisting of six bales. It was of superior quality; and our cotton-gin men say that they think they will be able to move one hundred bales during the season. Old cotton raisers say that the raising of cotton can be made a success here, and will become a leading crop here in a few years.—*Oswego Independent*.

Some features of the Oklahoma business are being overdone. The insinuations that the raiders are made up of unfortunates who have been enduring slow starvation on Kansas farms, is a reflection on the lands of that State not likely to be kindly received. The frantic eagerness of the emigrants to settle only on lands not open to settlement, excites the suspicion that they are acting in the capacity of a lobby at long range, for effect on Congress. The impression is gaining ground that these men, now ready to invade Indian territory, are the catspaw of some interested corporation, keeping a sharp lookout for the chestnuts. There is a right way and a wrong way to accomplish a thing in this country; and Indian territory will never be opened to settlement by wronging or defying the law.—*Inter-Ocean*.

THE INDUSTRIALIST.

SATURDAY, JANUARY 1, 1881.

H. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

The Milk of Different Breeds.

Some time ago, we had occasion to make an examination of the milk of different breeds of cattle, for the benefit of the class in dairying. The facts brought out by this experiment, although not by any means new, seem to us to be of interest beyond the limits of the class.

In the examination referred to, the milk of the pure-bred Jersey cow, the half-blood Jersey, and the pure-bred Short-horn, was placed in separate test-tubes to the depth of five and one-half inches, and allowed to stand twelve hours. Care was taken in the outset to secure the milk of cows which had received substantially the same feed and general treatment. The amount of cream thrown up by the different kinds of milk is shown by the following tabular statement:—

5½ inches Jersey milk gave 11-16 in. cream.
5½ inches ½ blood Jersey milk gave 14-16 in. cream.
5½ inches Short-horn milk gave 5-12 in. cream.

It will be seen from the above that the milk of the half-bred Jersey cow, was much more productive of cream than that of the full-blood Jersey, and the Jersey milk was much richer than the Short-horn. The fact that the milk of the half-bred Jersey was richer in cream than that of the pure-bred, agrees with the common experience of dairymen, who assert that the half or three-fourths bred Jersey is, for all the practical purposes of the dairy, equal to the full blood.

An examination of the skimmed milk of these different sorts, furnished another interesting fact. In the case of the Jersey milk, this was found to be thin, blue, and watery, the line separating the cream and milk being well defined; while, in the milk of the Short-horn, the skimmed milk was thick and opaque, and the distinction between cream and milk with difficulty made out. A microscopic examination made the reason of this quite plain. The buttery part of milk exists, in all cases, in the form of minute, nearly round, microscopic masses, which it is generally believed are enveloped by a thin sac of caseine or curd. In the case of the Jersey milk, these butter globules were found to be very irregular in size, the average being much larger than those found in the milk of the Short-horn. Jersey milk may be richer in butter than that of other breeds, but its chief value is doubtless owing to the fact that this butter exists in the milk in comparatively large masses, which come to the surface rapidly in the form of cream, leaving a thin, watery skim milk behind.

In the experiment referred to above, the same amount (5½ inches) of the "strippings"—the last of the milk drawn from the cow—of the half-blood Jersey, was set aside. In this, at the expiration of twelve hours, the upper two inches was somewhat darker and thicker than the remainder; but there was no perceptible line separating "cream" and "milk;" for, in fact, the strippings are cream, and should in all cases be placed directly in the cream jar.—*Prof. Shelton.*

Farmers' Institutes.

Summer has long been looked upon as the season for cultivation of the farm, while winter serves only as consumer of what the rest of the year has garnered. Might we not so learn to use the stormy days and long evenings of winter that it should seem the season for cultivation of the farmer? The progressive farmer finds his need of time for reading and information met by the enforced rest from outdoor labor which winter brings,

in spite of the never-ending accumulation of chores. How best to use these opportunities is one of his questions, and how to awaken the thirst for exact knowledge that will give the best spur to active thinking is another.

Farmers' lecture courses have been tried with limited success, and great gatherings of celebrated teachers in agricultural science have some prestige; but the palm for interest and direct results is granted to the short, earnest institute, in which the practical experience of farmers is mingled with the scientific observation of teachers. The most satisfactory samples of such institutes have been found during the last five years in the State of Michigan, where they are made an essential part of Agricultural College work, for the expense of which the State makes an annual appropriation. In them, Michigan farmers have found an excellent means of communication with the College, its teaching and experiments; a source of new interest in their calling; and such exchange of facts, methods and principles as must develop a higher type of farming.

Their means and methods are very simple. Six institutes only are held each winter, under the auspices of the Board of Control for the College. These are so distributed over the State as to accommodate the largest number of genuine farmers, care being taken to select villages large enough to accommodate the many outsiders who attend, and not so large as to prevent the institute from being one of the chief events of the winter. A local committee, having been granted an institute, provide a suitable hall, with extensive notice, select a careful presiding officer, and by consultation with members of the faculty arrange a programme of lectures and papers, of which at least one-half are prepared by the practical men of the neighborhood. Four sessions with from two to four articles in each, followed by discussion, fill two evenings and a day; and this is found to be the golden mean between too little and too much. From such a gathering, all return just full enough for healthy thinking, and hungry enough to be ready for the next opportunity.

The results of such institutes continued during several years, could not be told, if there were space for the attempt. They are proved by a thriftier look of farms and farmers, and increasing interest in all that can aid agriculture.

Why should not our State, whose reputation in other forms of agricultural teaching, the press, the grange, the fair, and even the old-time central institute, is excellent, add this also to her means of satisfactory development and progress? Who will be first to encourage and aid a movement in this direction? It is pleasant to hear that the State Grange, of a surety, is ready for the work.—*President Fairchild.*

Electric Bells in School-houses.

Yes, the College has a system of electric bells for calling and dismissing classes; and, as it has now been in successful operation for a number of years, we find we cannot "keep house without it." "Would you recommend such a system for a public school?" Again we say, Yes. If your class arrangements are such that a number of classes recite at the same time, and the recitations occur at regular, stated times in all the schools, you can adopt an automatic arrangement, for the ringing of bells, such as is used in this Institution. Our bells are rung at the beginning and end of each class hour by a simple mechanical arrangement designed for the purpose and fitted to the office clock. This device will admit of changes in the length of time between bells.

The bells must, however, ring at regular intervals, as the circuit is closed by clock-work, and these intervals must occur within an hour of each other. By adding to the mechanism, the bells can be rung at longer intervals than one hour.

Should the school routine require each teacher to hear recitations on his own time-card, regardless of that of others, it is often desirable that the principal's room should be connected to the other rooms by a bell system. Where such a system exists, the principal can, by simply pressing a button, ring a bell in each of the other rooms as a signal for a general assembly of the pupils for chapel exercises, or for a recess or adjournment of the different schools simultaneously, as the work of the school may demand. In addition to this, the principal can, by a very simple device, switch all the bells out of the circuit except his own, and use that for the movement of his own classes. It is also very convenient to have a bell in the janitor's room for calling or signaling him for various purposes. A code of signals can be very readily determined upon, by which he can be summoned or instructed in his duties.

The cost of such a system is small. Of course, the materials used are subject to changes in price as the market fluctuates, but below will be found an approximate estimate of the cost. The bells, either single stroke or vibrating, the use determines the kind necessary, cost about three dollars each. Office wire, No. 18, containing about 110 feet to the pound, costs about fifty cents per pound. Battery costs from one to two dollars per cell, according to kind. If necessary to connect two or more buildings, some line wire will be needed, costing about fifteen dollars per mile. Insulators cost about eight cents each. The initial cost is the only one of consequence. After the circuit is placed in working order, the only cost will be for maintenance of the battery, amounting to only a few cents per cell per year.

The adoption of such a system would, we think, add to the efficiency of school work, and tend to alleviate the "horrid grind" of the teacher.—*Sup't Graham.*

A Michigander on the Kansas Agricultural College.

Prof. A. J. Cook, of the Michigan Agricultural College, the well-known entomologist, who recently spent a couple of weeks in this vicinity, writes to the *Lansing (Mich.) Republican* as follows, concerning the Kansas State Agricultural College:—

The farmers of Michigan, the people about Lansing, and all other friends of the Michigan Agricultural College, will be glad to hear of its later born sister, the Kansas Agricultural College. This Institution is located at Manhattan, a pleasant city situated at the confluence of the Blue and Kansas Rivers, in Riley county, which county took the premium for making the best exhibits of agricultural products at the State Fair. The College has but 160 acres of land, where it stands, which lies on a slightly elevated terrace about one mile distant from the city. The President told me that they feel greatly the need of more land in the immediate vicinity of the College, which they are unable to satisfy. The farm is entirely surrounded by a fine stone wall, the material for which, as also that for the excellent stone buildings, was quarried from the Permian limestone right on the farm. The stone barn is a model of convenience, and was planned by the Professor of Agriculture, E. M. Shelton, a graduate of the Michigan Agricultural College, who is esteemed very highly as an officer of the College.

In the barn is a herd of very fine Short-horns. These are uniformly red; and, for size, touch, and symmetry, are hard to surpass.

Prof. Shelton is trying an experiment in pig-feeding which can but prove very valu-

able to the farmers of Kansas, as nothing so strikes the traveler in that State as the unprotected condition of the stock. Prof. Shelton has five hogs without shelter, and five of the same age in a warm, sheltered pen. All are fed all they will eat, and the amount fed and the increase per week carefully noted. Already, the Professor told me, are there striking results in favor of the shelter. It occurred to me, as I traveled through Kansas, that the loss from lack of shelter for the stock was enormous.

Besides the farm, there is a department of carpentry, of telegraphy, of printing, of blacksmithing, of sewing, of cooking, and of music. The last three and telegraphy are for ladies alone, except as the gentlemen pay \$1 a month for music or telegraphy. These several pursuits enumerated above are styled industrials; and each student selects some one, at which he works one hour each day without compensation. President Fairchild thinks that the shops and printing are very valuable, and would be a valuable addition at the Michigan College, which view commended itself to me as I watched their students at work, and saw the skill which marked their work. As President Fairchild suggested, by supplementing our work on the farm by work in the shops, more work could be profitably furnished and valuable skill acquired. The course of study is much like that of Michigan, though not so full; though they have a very full course in drawing, in which they are ahead of us. The work done by the students in this department is indeed very excellent.

The attendance at the Kansas College is about 200, nearly half of whom are ladies. President Fairchild speaks very highly of co-education. He thinks that with it, properly regulated, the course at Lansing would be more valuable to the students.

The friends of Prof. Fairchild will be glad to learn that his praises as President of the Kansas College, are in everybody's mouth. The admirable system and executive tact for which he was noted at Lansing, are everywhere apparent in his new field of labor. Nearly every professor told me that they had no need to urge their wants before the Board, for, in President Fairchild's hands, each was sure of his just due. President Fairchild gives frequent lectures in various parts of the State, and is rapidly bringing the College into public favor. He is Secretary as well as President, and is constantly devising new ways and methods whereby the usefulness and influence of the College may be enhanced.

Educational Gossip.

Burlingame has a school library of nearly six hundred volumes.

The Arkansas Valley Editorial Association meets at Wichita, January 8th.

Mrs. L. B. Kellogg, of Emporia, has been admitted to the bar as an attorney. Her husband is Probate Judge of Lyon county, and was formerly President of the State Normal School; and her father is Elder D. P. Mitchell.

Mr. O. S. Richards severs his connection with the Ellinwood schools, and goes to Great Bend to step into the place made vacant by Prof. Bain. Mr. W. M. Chalfant takes charge of the Ellinwood schools. The new programme goes into effect after vacation.

The following are the officers of the Kansas State Horticultural Society, elected for 1881: President, Prof. E. Gale, of Davis county; Vice-President, Judge M. B. Newman, of Wyandotte; Secretary, G. C. Brackett, of Douglas; Treasurer, Judge Wellhouse; Trustees, C. R. Graham, G. Y. Johnson, and Dr. Chas. Williamson.

On Wednesday last, about 5 o'clock, a boy by the name of Smith, aged about 15 years, and whose parents live west of this city, got into a quarrel with four colored boys; and, during the scuffle, one of the colored boys, aged 11 years, stabbed Smith about five times with a penknife. There are grave doubts entertained as to Smith's recovery.—*Osage County Chronicle.*

Joshua Fox, teacher in the Benton school, maltreated some of his scholars most outrageously, beating them over the head with a hedge-plant over an inch in diameter, and choking them almost to death. We are pleased to know that the board promptly discharged him; and it is now in order to revoke his certificate, as no brute should have control of a roomful of scholars ranging from five to fourteen years of age.—*Augusta Gazette.*

THE INDUSTRIALIST.

SATURDAY, JANUARY 1, 1881.

Prof. Lovewell, of Washburn College, Topeka, gave us the pleasure of a call this morning.

We call attention to the column of "Manhattan cards." The business men of Manhattan are noted for their honesty and industry.

The would-be student who wishes a catalogue addressed to North Topeka, would be much more likely to secure it, if he would send his name.

This, it will be seen, is No. 19-20 of the INDUSTRIALIST, which means that these two numbers are rolled into one, in consequence of Christmas and the rush of business incident thereto.

Sup't Stewart was the fortunate recipient of a Christmas present in the shape of a handsomely bound teacher's Bible, a present from the Sunday-school over which he is superintendent.

Some seventy students showed their appreciation of the generous terms granted by all the principal railroads of the State, in buying round-trip tickets for the vacation. A self-dependent student enjoys his visit home with greater zest for every dollar saved from the expense.

The "standing" matter of the INDUSTRIALIST has been re-arranged and much of it rewritten by President Fairchild. Look it over, gentle reader, and then hand it to some worthy young man or woman who may be interested to know where a common-sense, practical education is to be had.

The Regents of the College hold their regular quarterly meeting, at the College, on and after the evening of Wednesday, January 5th, 1881. All accounts against the College should be presented at once, that they may find place in the quarterly statement of the Secretary, and be audited for payment.

On the morning of Dec. 29th, our registering minimum thermometer marked sixteen degrees below zero. This is the lowest temperature, with two exceptions, on our records. On Jan. 8th, 1875, the reading was seventeen below; on Dec. 11th, 1868, sixteen below; on Jan. 28th, 1873, fourteen below; Jan. 4th, 1879, fourteen below.

President Fairchild wishes to express his gratitude for cordial greetings at both the State University and the State Normal, within the past few weeks. Prosperity seems reflected from the walls of both Institutions, lighting the faces of Faculty and students. We all sympathize in prosperity with far more pleasant associations than in adversity.

One of the handsomest and best papers for boys and girls is *The American Young Folks*, published at Topeka, Kansas. It is sent monthly, postage paid, for 50 cents per year. It is now in its sixth year, and every number filled with pure, entertaining and instructive reading. Parents need not hesitate to place this journal in their families. The publisher offers to send a sample copy for examination, free.

The *Commonwealth Annual*, a beautifully printed and handsomely illustrated little work, abounding in useful statistics, and containing much and varied information, has been received at this office. And, by the way, the *Commonwealth* came out a week ago in truly elegant form, with nine well-proportioned columns to the page, and, we judge, with new type throughout. We are glad to notice so many evidences of the prosperity of the *Commonwealth*.

We have been anxiously awaiting the receipt of the January number of the *Review of Science and Industry*, Kansas City. The *Review* has attained an excellence not expected in a western publication, nor in an eastern one at the low price of \$2.50 per annum. The publisher, Theo. S. Case, will supply to subscribers of the *Review* any periodical or standard book at 15 to 20 per cent off the list price. One cannot do better than by purchasing through him.

The Biennial Report of the College, which forms one of the supplemental documents to the report of Superintendent Lemmon, is issued from the State Printer's, for special distribution, in a neat pamphlet of over fifty pages. It gives in brief the progress made in all departments during the past two years, with concise statements of financial condition and prospects. The Board also present a summary of immediate wants, such as the generosity of the State is accustomed to supply.

While at Olathe last week, we became much interested in the co-operative grange store of that place. This institution commenced business four years ago, with less capital than \$1,000; it now does an enormous cash business, which is shown by the fact that during the past year, it has divided net profits among its stockholders amount-

ing to \$28,000. The secret of this great success seems to be the strict adherence to the cash system, a very fortunate selection of the manager, and the existence of a wide-awake farming community about Olathe.

The Leavenworth *Times* is not only one of the largest, newsiest papers published, but the cheapest. Just think: this great daily may be had for a whole year for \$5; and the mammoth weekly, for a single buzzard dollar. Surely, the force of cheapness could no further go. In the amount and variety of its news, and its excellent arrangement, the *Times*, indeed, distances all competitors; but, with this price, it evidently means to be read by every family in the State. The column of "State News" is alone worth the money. Address, THE TIMES, Leavenworth, Kansas.

The Manhattan INDUSTRIALIST, the organ of the State Agricultural College, and one of the neatest and most valuable papers of its kind we have ever seen, refers to the horse disease prevailing in the East as "epizootic." In a country paper like the *Republican*, such a blunder would not be noticed; but the State of Kansas cannot afford to have this use of the word endorsed by the INDUSTRIALIST, over the signature of Prof. Shelton.—*Grainfield Republican*.

With deep humility and a shamefacedness rare indeed in the INDUSTRIALIST office, we meekly own that we cannot see the point. Does the soul of Bro. Smith yearn for a seven-jointed Latin word ending in *um*? or is this a flank movement of the spelling reformer? We trust that the *Republican* will spare us further agony by explaining its little joke. If we have been guilty of "such a blunder" in failing to place a dieresis over the *o* in the fourth syllable of this sticky word, why, it's no more than Law and Paaren and all the great lights in veterinary science do. But, then, the "State of Kansas" does not own a dieresis in the INDUSTRIALIST office,—a fact which we respectfully refer to the ways and means committee of the next Legislature.

TWO STATE HORTICULTURAL SOCIETIES.

The joint session of the Kansas and Missouri State Horticultural Societies, at Wyandotte, brought pleasant greetings and profitable interchange of experiences between the well-known leaders of both States, in fruit and forest culture. To mention names among so many would distinguish without a sufficient ground for distinction. Both State Agricultural Colleges were represented, as they ought to be in any such gathering for the dissemination of tried truths in horticulture.

Many excellent papers were presented from both sides, touching the most practical questions of orchard planting, small-fruit culture, forest planting, and timber belts, with some lively debates over sorgho sugar as a means of general wealth, and pleasant hints upon adornment of the homestead by trees and lawns. The noticeable differences of opinion between extremes of East and West in the two States, showed how certainly general truths must be varied for the peculiarities of soil and climate, and how easily individual experience is accepted for a ruling principle. All of the seventy or eighty members present agreed in acknowledging the profit of such exchanges, and left with strengthened hopes of developing a wider interest and more definite purpose of growth for the two societies.

WINTER AND SPRING TERMS.

A winter term of twelve weeks begins on the afternoon of Monday, Jan. 3d, at which time applicants for admission will be examined. All should be prepared for examination in Arithmetic to percentage at least, and in elements of English, as well as in Reading, Spelling, Writing, and Geography. The regular first-year class will enter upon Book-keeping and U. S. History, continuing their study of the English language, by analysis of words and thoughts, and by exercises in expression.

Other classes will pursue the courses presented in the following arrangement of class hours:—

First Hour.—Geology, Horticulture, English Structure, and English Drill.

Second Hour.—Trigonometry, Chemistry, and Book-keeping.

Third Hour.—Logic, Geometry, and United States History.

Fourth Hour.—Zoology, Chemistry, Practical Agriculture, English Structure.

Fifth Hour.—Household Economy and Chemistry alternating, and Arithmetic.

Drawing and industrial classes will be so arranged as to accommodate the students.

Immediately after the close of the winter term, a spring term of ten weeks begins, during which the regular classes continue their course as follows:—

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Provision will be made for continuing classes less advanced than the regular first year; but all students entering at the beginning of the spring term, should be well advanced already in all the common-school branches. No beginning class will be organized.

Of these studies, each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urgently advised to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

A farmers' institute will be held in our city some time in February. President Fairchild and Prof. Shelton, of the Agricultural College, will be in attendance.—*Abilene Chronicle*.

COLLEGE DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

A permanent record of each student's standing in examination and classes, absences excused or unexcused, and general deportment, is preserved in the Secretary's office, showing upon a single page the actual progress throughout the course.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue. Students in the third year present declamations before the whole College, after previous training in rehearsals; and fourth-year students present original pieces after similar training.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms. Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Regular monthly lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

All the members of the Faculty cordially invite consultation by the students upon any questions of study or work.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East..... 12:20 P. M.
No. 4, going East..... 12:19 A. M.
No. 1, going West..... 4:00 P. M.
No. 3, going West..... 4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan..... 8:20 A. M.
No. 1 arrives at Manhattan..... 7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 P. M. Ladies admitted. New students cordially invited to attend. WM. J. LIGHTFOOT, President.

MISS DALINDA MASON, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

GEO. F. THOMPSON, President.

S. C. MASON, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.

G. H. FAIRLYER, Secretary.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Fairer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

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A. ADAMS.
Does a general delivery business. Conveys passengers to and from College. Round trip, 25 cts.

Hardware, Tinware, &c.
A. J. WHITFORD.
Handles everything in his line. Four doors west of post-office.

Mrs. Briggs' Bazaar.
The young ladies of the College are especially invited to call and examine my stock of goods, and get my prices, before purchasing elsewhere.

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KANSAS STATE AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or House- hold Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.—Second Year.—History of agriculture, showing the successive steps by which the art has attained its present position. History and characteristics of breeds; their adaptations to the varying conditions of soil, climate and situation; the relation of stock-raising to general farming. Cultivation of hood crops; management of corn and roots in reference to stock-feeding and the growth of the finer grains. The growth of the "tame grasses" in Kansas; the best sorts for the State, and their management, as shown by experiments on the College farm and elsewhere. Implements of simple tillage; mechanical principles involved in their construction. Application of labor. Draught; different adjustments, as affecting draught. Use of the dynamometer. Plows for soil and subsoil. Planning farm buildings, barns, piggeries and stables. Draining; soils that need draining; how to lay out a system of drains.

Fourth Year.—General principles governing the development of domestic animals. The laws of heredity of disease,—of normal, abnormal and acquired characters; atavism; correlation in the development of parts; in-and-in breeding and cross breeding; influences affecting fecundity; study of the forms of animals, as shown by the different breeds belonging to the College. The selection and arrangement of the farm with reference to the system to be pursued. Rotation of crops; general advantage of a rotation; the best rotation for distribution of labor, production of manure, and extermination of weeds. Manures; how best housed and applied; composting; commercial fertilizers. Agricultural experiments; field and feeding experiments. Stock-feeding and meat production; stall-feeding; soiling.

ANATOMY AND PHYSIOLOGY.—Third Year.—The study of Physiology is preceded by a course of lectures on anatomy. In this course, such consideration will be given to the form, structure and location of the different organs as is required for the proper comprehension of Physiology and Hygiene; and, in addition, the external form of domestic animals, particularly the ox and horse, will be studied by the class as a preparation for the study of Stock-breeding. The study of Physiology embraces a thorough consideration of the functions of the organs of the human body, and the relations these sustain to the condition of health and disease. Among the principal topics discussed, these may be mentioned: foods and digestions; assimilation; secretion and excretion; the circulation of the blood; the nervous system; the special senses; reproduction.

BOTANY.—During the course, two terms are given to the study of Botany. In the spring term, first year, the student is familiarized with the basis and aims of the botanical classifications to a sufficient degree to enable him to appreciate differences and resemblances in the plant kingdom, and is made acquainted with the salient points in plant physiology. In the spring term, fourth year, the intimate structure of plants, a more detailed study of plant physiology,—in the germination of seed, the growth of cellular substance, and the fertilization of the ovule,—variation, the improvement of varieties, parasitic fungi, are among the topics studied. A portion of this term is devoted to the principles of Landscape Gardening.

Although it is in a large degree the aim of this course in Botany to furnish a foundation for the study of applied Botany in agriculture and horticulture, the advantages of systematic observation and original investigation are kept in view; and the student anticipates the use of the text-book by the use of his eye and brain,—observing and comparing seeds, leaves, stems, flowers, and other portions of plants, keeping notes of his observations for presentation in the class. The plan is followed through the course, with each new topic. A good herbarium and series of charts are used as means of illustration.

LANDSCAPE GARDENING.—The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

HORTICULTURE.—It is the aim to teach this art from a botanical basis. The student applies his knowledge of the prime facts in botanical physiology to the various operations of the nursery, orchard and garden. The instruction is presented in a series of lectures upon the following topics, among others: The scope of Horticulture. General principles of propagation; by buds, by seeds. Production of improved varieties, by careful selection of seeds, by interfertilization of known kinds. Perpetuation of valuable sorts of fruit, by bud propagation; budding, grafting, layering, etc. The important points in nursery manipulation. The orchard; conditions of site, soil, exposure, elevation. Special treatment of the different kinds of fruit trees. Pruning; gathering and storing fruits. Small-fruit culture. Lists of varieties suitable for Kansas planting. Vegetable garden; selection and preservation of seed; planting and transplanting. The management and use of the hot-bed and cold-frame. Forest plantations. Wind-breaks. Hedges. Trees and shrubs for ornamental planting.

ENTOMOLOGY.—This science is studied with especial reference to its economical relations with agriculture and horticulture. A brief course in the principles of classification is followed by a more extended study of the life history of beneficial and injurious insects, and means of encouragement of one and the control of the other. Here, as in botany, the student is led to form a basis for the study by his own observations. The instruction is in the form of lectures. Illustrations are furnished from the individual collections of the students, from the entomological collections belonging to the Department, and detailed drawings and charts have been prepared, illustrating points of use in classification.

ZOOLOGY.—The time devoted to this study is principally given to a review of comparative anatomy and physiology. The latter portion of the term is occupied by a brief study of the system of zoological classification in present use, accompanied and illustrated by dissections and the study of fresh, alcoholic and mounted specimens.

INORGANIC CHEMISTRY.—This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Elliot & Storer.

ORGANIC CHEMISTRY.—This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. It is accompanied by laboratory practice.

CHEMICAL ANALYSIS.—In this course each student has his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Keldie's Manual.

MINERALOGY.—This includes the study of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms an important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

GEOLOGY.—A term's study in the fourth year gives a view of the causes which have produced geologic changes in the past, of the general arrangement of the earth's crust, and of special peculiarities of various strata. Attention is given to the formation of soils and deposits of valuable minerals, especially in Kansas.

AGRICULTURAL CHEMISTRY.—This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

HOUSEHOLD CHEMISTRY.—A course of lectures to a class of young ladies, embraces the chemistry of cooking; the composition of food: bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

PHYSICS.—This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical

Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.—Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

ASSAYING AND PHARMACEUTICAL CHEMISTRY may be provided for by special arrangement, when students are qualified to pursue them.

ARITHMETIC.—One term is given to a general review of arithmetic, the greater part of the time being spent on percentage and its applications. Accuracy and rapidity in computations are required. To those deficient in this respect, a thorough drill is given.

BOOK-KEEPING.—Beginning with a simple cash account, book-keeping is developed through all the principles of single and double entry. Each student provides a full set of blanks and keeps a regular set of books, in which accuracy of calculation and posting and neatness of execution are regarded as essential as correct understanding of the principles. No text-book is used, but all forms and problems are furnished in the class-room.

ALGEBRA.—Algebra is studied two terms. The first is wholly given to the literal notation. The student is thoroughly drilled in the fundamental rules, as applied to whole, fractional, and exponential quantities. The second term is devoted to the various forms of the equation and its applications. The equation in its various forms,—simple, quadratic, rational, etc.,—is studied, as an instrument for solving the problems of practical life, in which quantity is an item; for demonstration of geometrical and trigonometrical theorems; and for the construction of formulas for the use of the engineer and the artisan.

Three things are aimed at in the course in Algebra: first, to train the pupil to methods of reasoning; second, to attain facility in methods of operation; third, to secure expertness in the use of algebraic formulas.

GEOMETRY.—Two terms are given to Geometry. In geometrical drawing, the student has already become familiar with geometrical forms and their construction. The first term is devoted to plane Geometry, in connection with technical drawing, involving the use of lines, angles and surfaces. During the second term, solid and spherical Geometry are studied. Practical problems, involving the principles demonstrated, are given to the class. Hand-books of engineering and of various arts are used for reference.

TRIGONOMETRY AND SURVEYING.—The principles of plane Trigonometry, involved in mensuration and surveying, are first mastered. Surveying includes theory, adjustment and use of instruments; history and methods of U. S. Government Surveys; areas of land; dividing land; retracing old lines; platting; topographical surveying; railroad surveying; leveling—section and cross section; computation of earth-work; field practice, with transit, compass, chain, level and rod; drawing and ornamentation of plans and profiles.

MECHANICS AND ENGINEERING.—A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

DRAWING.—This study is taught four terms, two of which are in the first, one in the second, and one in the third year. Students that show special aptitude in this direction are permitted to pursue the study during the remainder of the course.

First Term.—Definitions of lines and geometrical figures; judging lines and angles; construction of perpendiculars to given lines, intersecting and bisecting lines, triangles, four-sided figures and polygons, the circle and its secant lines, ellipses, and various geometrical ornaments. Prof. Walter Smith's four books on geometrical drawing are used as text-books.

Second Term.—Free-hand drawing.—After the study of numbers 3, 4 and 5 of Prof. Walter Smith's Text-books of Art Education, drawing from nature is taken up. Leaves, flowers and fruits are taken as subjects, and placed in such positions that the perspective will not interfere seriously with a correct perception of form. Each student is required to finish a set of drawings. Lectures on principles and ornamentation are given occasionally.

Third Term.—Projection of the straight line and the circle; use of drawing-board, T-square, and water colors; principles of shades and shadows; principles of parallel and angular perspective; principles of topographical drawing.

Fourth Term.—projection of the conic sections and other regular curves; intersections of geometrical solids. Each student is required to draw and color a set of plans for a simple farm building, and another set of plans giving details of some farm machine.

ENGLISH LANGUAGE AND LITERATURE.—First Year.—The study of English Grammar is made to serve directly in clear perception and correct expression. Such practice in analysis and parsing as may give pupils a clear idea of the English sentence in all its parts, is associated with daily exercises in expression and criticism. A careful study of words and their elements,—roots, stems, prefixes and suffixes,—associating them with their origin and history, continues the course in English. Compound terms in formation and use, distinctions in synonyms, and associated meanings of words, are studied with care. Sentences are also analyzed with reference to their meaning, shades of thought, and propriety in expression. At the same time, the daily exercises are made a means of training in exact articulation, spelling, writing, and the essentials of good reading.

Principles and methods in English Composition are then taken up, with David J. Hill's Elements of Rhetoric for a text-book. Numerous exercises and revisions familiarize the students with the essentials of neat, legible, clear, and forcible manuscript.

Third Year.—A term's study of higher Rhetoric is occupied with the principles of clear explanation and convincing argument, as well as the outline of sound criticism. This is followed by a term spent in the history of English language and lit-

erature, with abundant illustrations from the best authors. Students are led in this way to appreciate the power of our mother-tongue, and at the same time to gain a slight acquaintance with the best thoughts of the world. Students are encouraged and directed in the use of the College library, and are under constant oversight in the expression of their thoughts in writing. Original declamations, carefully prepared, and delivered before the students and Faculty, make a part of the drill in the higher classes.

HISTORY AND POLITICAL ECONOMY.—The elements of United States History occupy a term's study in the first year; and special attention is given to the form and growth of the government under which we live. In the fourth year, a careful study of the Constitution of the United States is made to show the general principles of government, its means and methods, illustrated by historical references. A single term is given to the study of general history in outline, with especial emphasis upon the world's progress in science, literature and art.

The study of political economy in a full term of the fourth year, gives a fair presentation of subjects connected with production, distribution and consumption of wealth. Pains is taken to compare conflicting views, and point out sources of information on all sides of vexed questions without bias or prejudice.

LOGIC AND PHILOSOPHY.—The art of reasoning correctly is aided by a study of systematic logic, both deductive and inductive. Special prominence is given to methods for exact observation and experiment, and correct principles of classification. The previous researches and experiences of the student are made to illustrate these principles.

A short course in Psychology gives the general principles of intellectual and moral philosophy. Perception, understanding, reason, feelings and volition, are topics of explanation and analysis. Theories of right and wrong, and correct principles of action, are made the basis of a clear understanding of individual rights and duties.

SPECIAL HYGIENE.—To the ladies of the fourth year, a course of daily lectures is given by the lady superintendent of the sewing-room, upon the laws of life and health. The course continues through the entire term, and covers questions pertaining to personal health and the health of the household, such as food, air, exercise, clothing, temperature of rooms, etc.

HOUSEHOLD ECONOMY.—A series of lectures, accompanied by practical illustrations in the kitchen laboratory, continues through a term and a half. These cover the general ground of economical provision for the household,—marketing, cooking, preserving, order, neatness and beauty in table service, comfort of family, and care of a sick-room. These are supplemented by the lectures upon Household Chemistry and Dairying.

INDUSTRIAL ARTS.—The training in these departments is designed to be systematic and complete in each, so that any student following a single line diligently through a four years' course, gains the essentials of a trade and reasonable skill. Those who wish only a general acquaintance with these arts, can take shorter courses in several of them; but all are to select with definite purpose. In the regular course for farmers, agriculture and horticulture both are required as industrials during definite periods connected with their studies; certain terms of practice in the carpenter-shop are also essential to readiness upon the farm. These will be adjusted to each other as improved facilities and larger classes require.

Young ladies are required to give the necessary time for practice in the kitchen laboratory, and are expected to show some facility in the practice of the sewing room, though other industrials may occupy their course. Telegraphy and printing are open to the ladies, without fees.

In agriculture and horticulture, the practice is made to illustrate and emphasize the teaching, and covers essentially the same ground. Training in the other arts is as follows:—

Carpentry, etc.—All are enrolled as carpenters, and take the same first lessons in sawing, planing and dressing lumber, making mortises, tenons and joints, and in general use and care of tools. Later, one who chooses a trade is provided with work directly in the line chosen, while the farmers' course provides for general training a great variety of operations, rather for ingenuity than for skill. In the full course of a carpenter, special instructions are given in the whole range of work, from the framing to the stair-building. Students are allowed, after attaining sufficient skill, to work upon their own material, under the advice of the superintendent.

Printing.—Two courses are pursued in this art. In one the student is given a general view of the rise and progress of printing, of type-founding, stereotyping, electrotyping, and lithography. He is taught the implements or tools employed in typography, and how to use them; composition; imposition; principles and practice in plain and ornamental job work; presses and their workings; technical terms; and general duties of a first-class workman. The second course, the lessons of which alternate with those in the first, embraces instruction in spelling, capitalization, punctuation, proof-reading and correction; preparation of essays and criticisms on the same; and such other miscellaneous work as will make the student accurate and expert in language.

Telegraphy.—The course of training involves for beginners the characters that compose the alphabet, and combinations of these characters into words and sentences,—attention being paid to spelling and to short and precise expressions in messages,—abbreviations, signals, forms of messages, train orders, reports, etc. To the more advanced is given regular line business; as, press reports, messages, cypher messages, and orders in all forms used by prominent telegraph companies, together with the necessary book-keeping upon exact copies of the blanks in actual use. One day in each week is devoted to instruction in the use and management of lines, batteries, instruments, etc. The elementary principles of electricity, magnetism, and electro-magnetism, involved in telegraphy, are taught and illustrated by experiments. The more rapid modes of telegraphy, including duplex, quadruplex, and the telephone, are explained.

Sewing.—Young ladies are taught in all ordinary forms of sewing with needle and machine, and in cutting, fitting and trimming dresses and other garments. They may furnish materials and work for their own advantage during the hour of practice, under the direction of the superintendent.

Historical Society

THE INDUSTRIALIST



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KANSAS STATE AGRICULTURAL COLLEGE.

SUBSCRIPTION—50 CTS. A YEAR, 10 CTS. A MONTH.

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KANSAS STATE AGRICULTURAL COLLEGE. MANHATTAN, KANSAS.

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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of fourteen, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

The Wife's Use of the Husband's Credit.

The English Court of Appeal has just rendered a decision which is likely to cause a great deal of surprise among lawyers and unprofessional men, both in England and the United States. The appeal affirms the decision of the judges below, to the effect that a wife has no right to pledge her husband's credit unless she is duly authorized by him to do so, as in the case of any other kind of agent. The impression has long prevailed, that married women were at liberty to supply themselves with all kinds of articles suitable to their position in life on their husband's credit; but it seems that the English law now is, that this right is derived solely from an authority conferred and revokable by the husband. If he has been in the habit of paying bills contracted by his wife with particular tradesmen, the authority may be implied from the course of dealing; but even in such a case it may be withdrawn at pleasure. Theoretically, this decision is calculated to cause a joyful excitement among husbands all over the world, and a corresponding depression and melancholy among wives; but, practically, we doubt very much whether its results will be serious. Among well-to-do people, it is a necessity of the case that there should be an authority from the husband to make purchases and incur expenses of all kinds; and it is unlikely that this authority would be revoked or qualified except where matters between husband and wife had become seriously complicated, and in fact reached the point of an open quarrel. Among the poorer classes, the right of pledging a husband's credit has at no time been a valuable privilege; the husband in most cases having no credit to be pledged: at the same time, in some instances, the right may be of use for the purpose of marital discipline, and may therefore be recognized as among the few remaining legal privileges of married men as such.—*The Nation*.

The Dairy Industry.

The magnitude of the dairy industry in this country is shown by statistics compiled by Mr. Geo. P. Lord, of Elgin. He estimates the number of milch cows in the United States at over 13,000,000, requiring the annual product of 52,000,000 acres of land for feed, giving employment to 650,000 men, and requiring the labor of 866,000 horses. Estimating the cows at \$30 each, the horses \$80, and the land at \$30 per acre, together with \$200,000,000 for agricultural and dairy implements, and the total amount invested in the industry is \$2,219,328,000. This is considerably more than the amount invested in banking and the commercial and manufacturing interests of the country, which is \$1,800,964,586. The cattle and horses require two tons of hay each annually, or its equivalent.

If it is estimated that 5,000,000 cows are fed with grain for winter dairying, and that the horses daily require six quarts of oats or corn during the year, they will consume 28,383,300 tons of hay, 84,380,000 bushels of corn meal, 84,370,000 bushels of oat meal, 1,250,000 tons of bran, 30,000,000 bushels of corn, and 300,000,000 bushels of oats, of a total value of \$384,450,400. To this should be added the labor of 650,000 persons, at \$20 per month, \$156,000,000, making the annual value of \$504,459,400, or an average of \$38.80 per cow.

Accepting twelve cents per gallon as a basis for computing the value of the milk product, and 446 gallons as the average per annum (this being the average yield in sixteen states in 1860), the 13,000,000 cows produce annually 5,793,000,000 gallons of milk, worth \$695,760,000. Analysis shows that

3½ lbs. of milk contain the same kind and amount of nutrition as one lb. of boneless beef. The total weight of product is 50,732,600,000 lbs., equal to 14,495,000,000 lbs. of boneless beef.

About 50 per cent of the fat steer is boneless meat, so that it will require 20,650,000 steers of 1,400 lbs. weight, to produce the same amount of nutrition as the annual milk product. Such fat steers would sell at \$4.50 per cwt., or \$63 each,—a total of \$1,300,950,000: deducting from this amount, hide and tallow, \$260,190,000, leaves the meat value \$1,040,760. This gives the food value of the milk product in the United States annually. Willard, in his "Practical Dairy Husbandry," says that "milk at 24c. per gallon is equivalent in value to boneless beef at 9c. per pound." It is false economy, therefore, that substitutes meat for milk as an article of food.

The same authority (Willard) states that 50 per cent of the milk is used in making cheese and butter, and 41 per cent is consumed in a liquid state. The department of agriculture estimates there are 1,000,000,000 lbs. of butter and 300,000,000 lbs. of cheese made annually in the United States. At 27 lbs. of milk for one lb. of butter, and 9½ lbs. for 1 lb. of cheese, the total amount of milk used would be 28,950,000,000 lbs.: add 41 per cent of the product for consumption, the total production is 60,752,325,000 lbs., within a small fraction of 1 per cent of the estimate made. The caseine in the milk used for making butter, if utilized for cheese, would produce annually 1,800,000,000 lbs.; and, besides, there is annually run off, in the skimmed milk, butter milk, and whey, 200,000,000 lbs. of milk sugar, which, if saved, would have a market value greater than the entire annual sugar crop of Cuba.—*Prairie Farmer*.

The Professor and the Door-stone.

Referring to mistaken ideas about relics, recalls the story in a German paper about a certain professor, which is a parallel to the Bill Stump adventure of Pickwick. This German antiquary made the delighted discovery that a stone placed over a stable door bore the inscription, 1081. "I must have that stone in my collection, cost what it may," thought the savant. Calling a tenant farmer, who was the proprietor, the professor said to him eagerly: "Did you not obtain this stone from the castle ruin on the hill yonder?"

"It may be that my grandfather fetched it thence, when he built the stable," was the reply.

The antiquary then asked what he would take for the stone.

"Since you appear to have a fancy for it," said the farmer, "give me forty guilders, and I will bring it to your house."

"Rather a large sum," said the professor; "but bring it to my residence and you shall have the money."

When in due course the farmer brought the stone upon a truck, the zealous antiquary turned it over to refresh his eyes with a sight of its venerable chronological inscriptions, not without anxiety that it might have been damaged in its removal.

"Why," he exclaimed, "what is this? This is not the right stone. On the stone I bought from you was the date 1081, while this bears the very modern date 1801, which proves that the other was exactly 720 years older than this."

"Do not trouble about that," said the peasant. "The masons, you see sir, turned the stone upside down when they set it in the doorway, because it fitted better that way. You can turn it whichever way you like; but of course I must have the money agreed upon."

Our Exchanges.

The Oklahomians are still hanging out on Fall Creek, but not quite so strong as two weeks ago. A good many of them are beginning to get their eyes open.—*Caldwell Post*.

At a lyceum on Limestone, the subject proposed for debate recently was: "Which is the most injurious to the farmer, the agricultural implement agent or the chinch-bug?" It was decided that the chinch-bug was comparatively harmless.—*Jewell County Review*.

Three wolves attacked a son of Capt. Lathrop last week, in the edge of town, while on his way home, and attempted to drag him from off the horse, tearing his pants badly. They pursued him in hot chase about half a mile or more.—*Marysville News*.

It would doubtless encourage wool-growing if our Legislature would pass a law this winter, levying a tax of \$1.00 per head on the dogs in the State, setting aside the money thus raised to pay for sheep that are killed by dogs. Similar laws in other States have encouraged sheep-raising.—*Iola Register*.

The salt works of the eastern part of the county are being put in trim for effective work. A large force of hands is employed. Ten carpenters are preparing and joining the lumber for the vats. There are to be 33 vats 16 feet wide and 300 feet long, besides one large vat 200 feet square. The works, when completed, will cover an area of about twelve acres.—*Salina Journal*.

A young man named Beam, son of Hon. John A. Beam, landed here last evening from the cars; and we learn that he is one of the lucky gold hunters who "struck it rich." He and another man named Fisher have just sold a lead of gold-bearing quartz near Lake City, Colorado, for the neat little sum of \$110,000. He drew a prize where 999 others have drawn a blank. Don't all start for the mountains, boys.—*Lawrence Journal*.

The workmen on the west wing are getting along well with their work; but, owing to the non-arrival of some of the heaters, it is probable that it will be impossible to get the new Representative Hall ready for occupancy by the time the Legislature meets. Should they not get it ready by the 10th of January, and the House desires to occupy it later in the season, a removal can be easily effected during the usual adjournment from Friday to Monday.—*Commonwealth*.

The Central Branch road is doing well. They received orders along their road lately for 231 empty cars, in which to ship stock and grain to Atchison. This don't look very much like destitution in Kansas. Let eastern people know that this section of country has a surplus, and that the C. B. road cannot any more than meet the demands on them at present for shipping facilities. There is not an empty car at any of the stations that lays over longer than it takes for trains to take them away, on being found empty.—*Kirwin Chief*.

Mr. Charles Whiting informs us that he has received \$800 worth of seeds for the purpose of seeding the Diamond Springs Ranch in tame grasses. About three hundred dollar's worth constitute several varieties received some weeks ago, and a shipment of \$500 worth of orchard-grass seed was received from Louisville, Ky., last week. This will doubtless be considered a rather extensive purchase of seed for the use of one place; but the ranch in question is the largest in this country, containing some 4,000 acres, all under fence.—*Council Grove Republican*.

THE INDUSTRIALIST.

SATURDAY, JANUARY 8, 1881.

B. M. SHELTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

THE month of December, 1880, is remarkable for the low temperature that prevailed during most of the month; but there was a period of comparatively mild weather near the middle of the month. The latter part was extremely cold. Mean temperature of the month at 7 A. M., 17°.82; at 2 P. M., 30°.74; at 9 P. M., 24°.43. The mean of the whole month is 24°.4, 5°.72 below the mean of December. Maximum temperature, 65°, on the 13th; minimum temperature, -16°, on the 29th. This low temperature was reached also on Dec. 11th, 1868. The lowest on our records, seventeen below, occurred on Jan. 8th, 1875. The warmest day of the month, 44°.3, occurred on the 13th; the coldest, averaging -4°.6, on the 28th. Mean temperature of last five days of the month, 2°.7. Per cent of cloudiness for entire month, 59; for the 14 days from the 15th to the 28th inclusive, 93 per cent. During this period, light snow fell on a number of days, but aggregated only 3 inches in depth. When melted, it made .23 inches of water. This is the total rainfall for the month. Average rainfall for December, .87 inches. Mean barometer, 28.69: mean at 7 A. M., 28.69; 2 P. M., 28.66; 9 P. M., 28.71: highest, 29.21: lowest, 27.92. The wind was in the north at eighteen observations; southwest, 16; northeast, 13; east, 12; northwest, 11; west, 10; southeast, 7.

Cattle Feeding in the West.—Full Feeding.

At a meeting of the Central Kansas Breeders' Association, held in the College on Thursday last, a very interesting paper was read by Mr. J. J. Mails, of Pottawatomie county, of which the following is an abstract.

The writer began by saying that when he commenced feeding, four years ago, he supposed he then knew how to fatten cattle in the shortest time and with the least outlay of feed; but the more he had studied the subject, the stronger became his conviction that the best and most economical methods had yet to be discovered. This is shown by the reports from different breeds, as published by the State Board of Agriculture. One feeder recommends feeding shocked corn for the first month, then snapped corn, then clean husked corn, finally finishing with shelled corn, and giving meanwhile all the hay the animal will eat: another feeds without hay while feeding corn with the husk on, and still another feeds all through without any hay. Another recommends feeding clean husked corn the first hundred days, then finishing on shelled corn; and another believes in feeding on shelled corn first, and finishing on meal. The writer stated that he had known other feeders who had fed wholly on meal, and with very poor results. These facts seem to show how widely opinions differ in this important matter of beef production.

The writer would begin feeding about Sept. 1st, and certainly not later than the 15th; giving snapped corn on the ground in the pasture, feeding about fifteen ears of corn per day to each animal, gradually increasing the amount until one-fourth of a bushel is reached, and keeping them at this so long as the grass is green. He would then change the herd to the "feed-lot," which, in size, should not be less than two acres for every fifty head of cattle: though five acres would be better. The situation of the "feed-lot" was an important matter. This yard should, if possible, be in the tim-

ber, and well protected from the north and west winds.

In the yard, he would commence feeding snapped corn, giving all that the animals will eat clean, until about January 1st. After this he would feed of husked corn until the 1st of March; and, if feeding is carried on after this date, shelled corn should be fed exclusively. This last is an especially important matter in the case of cattle three years old and under, as at that age they are shedding teeth and cannot eat enough of ear corn.

In regard to the amount of hay, he would feed the best of prairie hay, and all that the animals wanted during the entire period of feeding. Millet and Hungarian hay were objectionable, as it was too "loosening" in its effect upon the bowels of the animals. Salt should be kept constantly before the animals. Where this was fed only at intervals of time, the animals gorged themselves, and an attack of "scours" almost inevitably followed. As to the time and times of feeding, he would feed in the morning between 7 and 8 o'clock, when the cattle are quiet and not disposed to crowd around the feed boxes, as they will do when fed later in the day; and he would in no case feed oftener than once each day.

That our systems of feeding, however well suited to our circumstances and surroundings, was radically wrong, the writer had no doubt. This was shown by the fact that, with all this lavish outlay of corn and labor during the seven months following October 1st, not more than three to four hundred pounds of gain could be expected from each animal; while upon prairie grass about an equal amount of flesh may be made in five months. Can it be possible that our much-maligned prairie grass, is after all richer in fat-producing elements than corn itself? or does the cold of winter make all this difference?

It is a matter of the utmost importance that the steer be fed in a comfortable yard. It was literally throwing corn away to attempt to feed cattle in an open yard, in which the mud stands to the depth of six or more inches. The cattle will, no doubt, eat as much or more under these conditions as when kept under cover and out of the mud; but they give really nothing for the food consumed, the whole going, apparently, to keep up the animal heat of the body. It is often claimed that this corn is utilized by the hogs that "follow" the cattle; but, where the droppings and even whole ears fall into the mud, the loss is total.

This paper provoked a very animated discussion, which was participated in by nearly every one present. We regret our inability to give in full, or even the substance, of this discussion.

Dr. Vail insisted that our feeders must grind and cook their corn, and provide the animals with good shelter. This was in accordance with physiology and, he believed, true economy. O. W. Bill would have his animals fat, and consequently ready for sale, at that season when good beef was in greatest demand, in December and June. To this end, he would push his steers from the start, keeping them, from the time they were yearlings, always ready for the market. He thought that too often the yearlings were neglected, to the great detriment of the animal subsequently.

A. Miller, of Junction City, gave some very interesting experiments in feeding cattle and swine, which he has promised to give in full in a paper at the Breeders' Institute, to be held in this place, beginning Feb. 14th. He was inclined to favor the use of cob-meal, or rather a meal made of

ground corn and cob. Had obtained excellent results from the use of this feed. He called attention to the practice of soaking corn and feeding it after it had become sour, and believed this the most satisfactory preparation of corn for hogs.

A. W. Rollins gave the method of feeding practiced by the noted feeders and breeders, Messrs. Potts, of Jacksonville, Illinois. Their plan was to feed ground corn or oats, intimately mixed with cut hay of the best quality.

Messrs. Allen, Huse, Marlatt, Kimball, and others, made interesting statements of their own methods of feeding, the details of which we are unable to recall.—Prof. Shelton.

Meteorology of the Year 1880.

The mean temperature of the year is 53°.39. This differs by one-eighth of a degree only from the mean annual temperature at this place for twenty years; the latter being so much less. The individual months, however, generally depart very much from the mean of the month: this is shown in the appended table. The highest temperature of the year, 97 degrees, occurred on the 19th of August. The minimum temperature, sixteen below zero, occurred on the 29th day of December. The heavy rains during November, 1879, left the earth thoroughly charged with water; and, although the first months of the year 1880 were very dry, vegetation did not suffer as might have been expected from the current rain-fall. Each month to August had a meager precipitation. During this latter month, the very unusual fall of 8.51 inches of water, occurred. There was light snow on a number of days. But the total snow-fall for the year amounted to but six and one-quarter inches. The greatest depth of snow on ground at any one time was three inches. This was near the close of December. It afforded the only sleighing of the year.

The last frost of the spring occurred on the morning of April 30th. The first killing frost of the autumn was on the morning of the 4th day of October.

There was good skating on Thanksgiving day, Nov. 25th. This has seldom been seen in the locality. But, if the last months of the year were below the mean, the first were above it.

With the exception of a few days of windy, dusty weather in the early spring, the year with us has been unusually free from such severe storms as have visited neighboring States.

Months.	Relative Humidity.	Maximum Barometer.	Minimum Barometer.	Mean Barometer.	Max. Temp. Days.	Min. Temp. Days.	Mean Temperature.	Rainfall for 20 years.	Mean temperature for 20 years.	Rainfall for 20 years.
January.....	77	29.10	28.05	28.57	18	12	37° 16'	.56	26.89	.70
February.....	62	29.09	28.02	28.57	22	14	41° 04'	.50	32.38	.89
March.....	66	29.02	27.92	28.54	17	8	41° 04'	.50	41.32	1.11
April.....	74	29.02	27.92	28.54	17	8	41° 04'	.50	53.25	2.69
May.....	72	28.98	28.27	28.65	16	9	44° 40'	.374	65.85	4.09
June.....	72	28.91	28.17	28.57	12	9	44° 40'	.374	73.95	4.37
July.....	83	28.86	28.46	28.66	12	9	44° 40'	.374	77.19	3.54
August.....	80	28.82	28.42	28.65	13	9	44° 40'	.374	82.92	4.74
September.....	75	28.83	28.36	28.65	16	8	44° 40'	.374	81.71	3.23
October.....	69	28.98	28.21	28.69	16	7	44° 40'	.374	83.36	2.13
November.....	72	29.16	28.25	28.66	16	7	44° 40'	.374	83.36	1.68
December.....	60	29.21	27.92	28.69	13	6	44° 40'	.374	83.36	.87
Total.....					136	10	44° 40'		83.36	30.04

In the table given below, is shown, for each year, the highest and lowest tempera-

tures, with dates, and the mean temperature of the year, with amount above or below the mean temperature of the place:—

Years.	Maximum temperature.	Minimum temperature.	Mean temperature.	Above or below average for 20 years.
1859 { July 15th.....	104°	-8°	54°.83	+1°.55
1859 { December 16th.....	112	-6	57°.01	+3°.73
1860 { July 27th.....	99	-9	55°.04	+1°.76
1861 { August 4th.....	103	-6	52°.99	-.29
1862 { February 2d.....	96	-4	55°.39	+2°.11
1863 { July 6th.....	104	-13	52°.08	-1°.20
1864 { January 14th.....	95	-12	52°.16	-1°.12
1864 { August 20th.....	98	-16	51°.76	-1°.52
1867 { February 3d.....	93	-3	49°.44	-3°.84
1868 { September 1st.....	102	-11	54°.19	+°.91
1870 { July 14th.....	100	-7	54°.89	+1°.61
1871 { December 23d.....	98	-10	52°.86	-.42
1872 { June 27th.....	104	-14	52°.14	-1°.14
1873 { July 9th.....	110	-4	53°.42	+°.14
1874 { August 31st.....	98	-17	50°.41	-2°.87
1875 { January 24th.....	95	-8	51°.79	-1°.49
1876 { June 22d.....	100	-11	54°.15	+°.87
1877 { January 15th.....	97	-7	54°.32	+1°.04
1878 { August 24th.....	99	-14	54°.64	+1°.36
1879 { December 27th.....	97	-16	53°.39	+°.11
1880 { August 19th.....				
1880 { December 29th.....				

† Above the mean; - below the mean.

* The records for the years 1865 and 1866 are not complete. These years are omitted from the table.

An examination of the table shows that, during the earlier years over which our records extend, higher temperatures were reached. An attempt is made, during the later years at least, to avoid any errors incident to defective instruments, and exposure.—Prof. Failyer.

Educational Gossip.

Mr. S. S. Tipton, former principal of the Burlington schools, is now managing a large publishing house in Chicago.

Among the late graduates of the California College of Pharmacy, was Frederick Grater, one of the first boys born in Leavenworth.

Several leading papers advocate the passing of a law excluding children under six years of age from the public schools of the State.

Prof. Geo. M. Stearns, of Washburn College, purchased, while East, a \$500 bell, that will be at once placed in position at the College.

Five counties in our State have entrusted their county superintendents' office to ladies. Chase county has elected Miss Mary E. Hunt; Jackson county, Mrs. O. E. Stout; Sedgewick county, Miss Lydia Benton; Trego county, Mrs. Florence Morse; Anderson county, Miss Eva A. Hobert.

The Kansas Eisteddfod, a Welsh literary institution, the second gathering of its kind, open to all the literary talent of the State of Kansas, was held at Bancroft Hall, in this city, on Christmas day last; and, being an old and favored institution among the Welsh, a large number had arrived here from all parts of the State the day before, prepared to do full justice to the literary treat, and to enjoy the music of the occasion.—Emporia Journal.

Speaking of the war of school histories in Kansas, the *Commonwealth* concludes a lengthy editorial with the following sensible words: "If we drive the South to write their own histories, we of the North will be represented as tyrants, ravagers and murderers of their martyred dead, over whose graves their children are taught to weep. Like Hannibal, the Southern youth will be taught to swear eternal hatred to the foe of his fathers. The children of the glorious commonwealth of Kansas need no lessons in loyalty. They love their country as we love our parents. They do not need to be told that treason is odious: that idea is born in them; argument would weaken it; repetition render it less heinous. It is only at the South that sentiments of loyalty need cultivation; but it requires wisdom and moderation to teach it right."

THE INDUSTRIALIST.

SATURDAY, JANUARY 8, 1881.

"A cold day," did you say?

Next week we shall give a report, in full, of the proceedings of the Board of Regents, now in session.

Next week we shall publish, in full, the report of the Committee on Education, of the State Grange.

The Board of Regents has been in session during the past two days. It will probably adjourn to-day at noon.

One hundred and ninety-five students have reported for duty and have been assigned, so far this week. These figures call up visions of long lists of students in the spring catalogue.

Secretary Beckwith notifies us of the meeting, in State Convention at Topeka, Jan. 18th, of the Kansas wool-growers and sheep-breeders, for the purpose of securing legislation in aid of this important interest.

Just think: for fifty cents,—the price of two bushels of corn, two prairie chickens, two handfuls of fire-wood, or three or four jack-rabbits,—you can have the INDUSTRIALIST a whole year.

The Riley Center Independent concludes some friendly observations about the College as follows: "To those who wish to prepare themselves to enter upon the active duties of life with a surety of success, this College offers the greatest advantages."

We are indebted to Hon. D. B. Long, Fish Commissioner, for a copy of his second biennial report. This report shows very conclusively that Mr. Long has worthily performed the duties of his office, and for the great ultimate good of the State, we doubt not.

At the meeting of the Central Kansas Breeders' Association, held in the College on Thursday last, it was determined to hold a Breeders' Institute in Manhattan, beginning Feb. 14th. Several gentlemen prominently connected with the stock interests of the State have promised to be present and furnish papers. No doubt a very successful meeting will be had.

IMPORTANT DECISION IN THE DRIVE-WELL CASES.

News was received here yesterday, from the clerk of the United States Court, lately in session at Topeka, to the effect that two of the drive-well cases from this county have been decided, by Judge McCrary, in favor of the defendants. This information, we know, will be received with hearty rejoicings, not here only, but all over the State and country. Doubtless, this is only the beginning of the end; but certainly the time is near at hand when every man may make a hole in the ground without let or hindrance from the Green monopoly.

The January meeting of the Scientific Club was held on the evening of the 7th. There was a good attendance, and the meeting was opened promptly.

Mr. J. C. Allen presented a paper on Prof. Tice's new system of meteorology. The reviewer did not feel competent to criticise the theories therein advanced, but gave the principles upon which they are founded. It was evident, however, that he was not an entire convert to the new faith. Prof. Popenoe gave a very interesting paper on the Flora and Insect Fauna of Kansas, treating especially of their distribution in its relation to altitude and climate. Both of these papers elicited considerable discussion.

Mr. M. A. Reeve placed in the cabinet belonging to the Club, several fine fossil leaves and specimens of crinoids, from the coal measures of Osage county. Mr. W. Knaus presented a very choice fossil fish, obtained in Wyoming Territory.

SECRETARY.

FARMERS' INSTITUTES.

From the Olathe Leader, we copy the following report of a committee of the State Grange, referring to a work proposed by the Agricultural College:—

Manhattan College Faculty proposes to aid in holding institutes as follows: The College Faculty will furnish one-half the programme; the local grange where the institute is held, the other half. The institute shall be held over two days and one night, and the Faculty will assist in making the programme, and will perform their work gratuitously.

Resolved, That the above proposition meets our hearty approval, and that we welcome the Faculty of Manhattan College as co-workers in our noble cause.

Resolved, That there be at least four institutes held during this winter and spring, in the four quarters of the State as far as practicable, and would recommend Labette, Butler, Cloud, and Jefferson counties, and therefore recommend that the delegates from said counties be held responsible for fixing the time and place for said institutes, corresponding with Manhattan College and harmonizing with their wishes.

Alpha Betas called to order by President Lightfoot. Secretary being absent, Miss Quinby was appointed to fill vacancy. Music by committee was good. It being the first meeting of the term, the Society proceeded to election of officers. After a closely contested election, W. J. Jeffery was elected President; B. L. Short, Vice-President; May Quinby, Secretary; Emma Campbell, Treasurer; Rebecca Coburn, Marshal; Jacob Lund, assistant Marshal. This exercise was followed by a spirited debate on the question, "Resolved, That trade-unions are a benefit to its members." Decision in favor of the negative. Declaration by J. Lund was well rendered. Under report of committees, Grace Parker reported that our new charter had arrived, and that it made us a chartered institution for ninety-nine years to come. Debaters next week: E. Kern and S. N. Swingley; assistants, Miss Selden and Miss Campbell. Question, "Resolved, That Gen. Grant deserves neither money nor honor for services rendered in the past." The Society is in a flourishing condition, and much hard work is being done. Gleaner next week. Come one, come all.

EFFIE.

WINTER AND SPRING TERMS.

A winter term of twelve weeks begins on the afternoon of Monday, Jan. 3d, at which time applicants for admission will be examined. All should be prepared for examination in Arithmetic to percentage at least, and in elements of English, as well as in Reading, Spelling, Writing, and Geography. The regular first-year class will enter upon Book-keeping and U. S. History, continuing their study of the English language, by analysis of words and thoughts, and by exercises in expression.

Other classes will pursue the courses presented in the following arrangement of class hours:—

First Hour.—Geology, Horticulture, English Structure, and English Drill.

Second Hour.—Trigonometry, Chemistry, and Book-keeping.

Third Hour.—Logic, Geometry, and United States History.

Fourth Hour.—Zoology, Chemistry, Practical Agriculture, English Structure.

Fifth Hour.—Household Economy and Chemistry alternating, and Arithmetic.

Drawing and industrial classes will be so arranged as to accommodate the students.

Immediately after the close of the winter term, a spring term of ten weeks begins, during which the regular classes continue their course as follows:—

First Year.—Algebra. English Composition. Botany, with Drawing.

Second Year.—Geometry completed. Entomology and Anatomy. Analytical Chemistry, or Household Chemistry and Economy.

Third Year.—Analytical Chemistry, or Household Economy and Chemistry. Mechanics, with Drawing. Agricultural Chemistry, or General History.

Fourth Year.—Geology. Political Economy. Agricultural Chemistry.

Provision will be made for continuing classes less advanced than the regular first year; but all students entering at the beginning of the spring term, should be well advanced already in all the common-school branches. No beginning class will be organized.

Of these studies, each student is required to take three, and none will be allowed more than three except by special permission of the Faculty. Students are urgently advised to take up studies in the order of the prescribed course for gentlemen or for ladies; but provision will be made for select courses, in cases where age and ability make them desirable. A glance at the list of studies will show the range for selection.

The industrial branches, of which every student is required to select one, are essentially the same as elsewhere announced.

ENTERING COLLEGE.

Candidates for admission at the beginning of the fall or winter term, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College, who will furnish information as to rooms and boarding places as well as college duties.

Students should bring letters of recommendation from home, or from the school last attended, that they may at once find friends, if possible, in this their new home.

Upon arriving, each should leave bulky baggage

at the depot until a boarding place is secured, and at once enquire for the President's office at the College. Not an hour should be lost in completing arrangements for immediate work. Having found a place to live, each student, new or old, is expected to notify the President where his room is.

Not a day should be lost from the classes, if arrangements are possible without it.

COLLEGE DUTIES AND PRIVILEGES.

All students are expected, unless excused by the Faculty, to attend chapel each morning of academic days, and divine service once each Sabbath in one of the city churches. Excuse must be rendered in case of absence.

Prompt attendance upon all class exercises is strictly enforced, and failure to render excuse for absence or tardiness is considered a misdemeanor. No student is allowed to withdraw from a class or from College without permission of the Faculty; and accurate and steady business habits are required to maintain one's standing in classes.

All daily exercises are graded in a scale of 100 for perfect; and at the close of each month an examination is held to test the work of each student, its result being graded in the same scale. An average monthly grade of 60 must be maintained to retain a place in the classes; and in cases where more than three studies are allowed, a grade of ninety or above must be secured in each study. Students failing to maintain their place in the classes are supposed to be wasting time and means, and their parents will be requested to take them home.

A permanent record of each student's standing in examination and classes, absences excused or unexcused, and general deportment, is preserved in the Secretary's office, showing upon a single page the actual progress throughout the course.

Declamations and compositions are required throughout the course, as a part of training in our mother tongue. Students in the third year present declamations before the whole College, after previous training in rehearsals; and fourth-year students present original pieces after similar training.

The College library, containing a good selection of books and periodicals, is open daily during study hours; and students are allowed to draw books, under proper restrictions, for use at their rooms.

Two literary societies are maintained by the students, a room in one of the buildings being assigned for their exclusive use.

Members of the Faculty and more advanced students have organized a Scientific Club, for study and observation of facts in nature about us. Its meetings are held on the first Friday evening of each month.

The monthly meetings of the Central Kansas Stock-breeders' Association and of the Manhattan Horticultural Society are held at the College, and are always open to students.

A singing class is taught by one of the Professors; and singing, is a part of each morning's chapel exercises.

A weekly prayer-meeting is maintained by the students and members of the Faculty.

Regular monthly lectures upon topics connected with student life will be provided by members of the Faculty or invited celebrities.

All the members of the Faculty cordially invite consultation by the students upon any questions of study or work.

General good conduct, such as becomes men and women anywhere, is expected of all. Every student is encouraged in the formation of sound character by both precept and example, and expected "upon honor" to maintain a good repute. Failure to do so is met by prompt dismissal. No other rules and regulations are announced.

RAILROAD TIME-TABLES.

UNION PACIFIC RAILWAY.

KANSAS DIVISION.

No. 2, going East.....	12:20 P. M.
No. 4, going East.....	12:19 A. M.
No. 1, going West.....	4:00 P. M.
No. 3, going West.....	4:10 A. M.

M., A. & B. RAILWAY.

No. 2 leaves Manhattan.....	8:20 A. M.
No. 1 arrives at Manhattan.....	7:40 P. M.

The trains on this road connect closely at Burlingame with the A., T. & S. F. trains, both east and west.

GEO. C. WILDER, Agent.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 p. m. Ladies admitted. New students cordially invited to attend.

W. J. JEFFERY, President.

MISS MAY QUINBY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WIRT S. MYERS, President.

H. L. CALL, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.

G. H. FAIRLYER, Secretary.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Fairlyer and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

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Fine Stationery, Pocket-Books, Gold Pens, Envelopes, Blank Books, etc. No. 127, Poyntz Av.

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WM. KNOTSMAN.

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Barber Shop.

P. C. HOSTRUP.

Don't fail to call, if you want a good, easy shave, a first-class hair-cut, or a good bath. Shop opposite Purcell's store.

Stingley & Huntress.

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Does a general delivery business. Conveys passengers to and from College. Round trip, 25 cts.

Hardware, Tinware, &c.

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Handles everything in his line. Four doors west of post-office.

Mrs. Briggs' Bazaar.

The young ladies of the College are especially invited to call and examine my stock of goods, and get my prices, before purchasing elsewhere.

Manhattan Bakery.

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KANSAS STATE AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or House- hold Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.—Second Year.—History of agriculture, showing the successive steps by which the art has attained its present position. History and characteristics of breeds; their adaptations to the varying conditions of soil, climate and situation; the relation of stock-raising to general farming. Cultivation of hood crops; management of corn and roots in reference to stock-feeding and the growth of the finer grains. The growth of the "tame grasses" in Kansas; the best sorts for the State, and their management, as shown by experiments on the College farm and elsewhere. Implements of simple tillage; mechanical principles involved in their construction. Application of labor. Draught; different adjustments, as affecting draught. Use of the dynamometer. Plows for soil and subsoil. Planning farm buildings, barns, pigsties and stables. Draining; soils that need draining; how to lay out a system of drains.

Fourth Year.—General principles governing the development of domestic animals. The laws of heredity of disease,—of normal, abnormal and acquired characters; atavism; correlation in the development of parts; in-and-in breeding and cross breeding; influences affecting fecundity; study of the forms of animals, as shown by the different breeds belonging to the College. The selection and arrangement of the farm with reference to the system to be pursued. Rotation of crops; general advantage of a rotation; the best rotation for distribution of labor, production of manure, and extermination of weeds. Manures; how best housed and applied; composting; commercial fertilizers. Agricultural experiments; field and feeding experiments. Stock-feeding and meat production; stall-feeding; soiling.

ANATOMY AND PHYSIOLOGY.—Third Year.—The study of Physiology is preceded by a course of lectures on anatomy. In this course, such consideration will be given to the form, structure and location of the different organs as is required for the proper comprehension of Physiology and Hygiene; and, in addition, the external form of domestic animals, particularly the ox and horse, will be studied by the class as a preparation for the study of Stock-breeding. The study of Physiology embraces a thorough consideration of the functions of the organs of the human body, and the relations these sustain to the condition of health and disease. Among the principal topics discussed, these may be mentioned: foods and digestions; assimilation; secretion and excretion; the circulation of the blood; the nervous system; the special senses; reproduction.

BOTANY.—During the course, two terms are given to the study of Botany. In the spring term, first year, the student is familiarized with the basis and aims of the botanical classifications to a sufficient degree to enable him to appreciate differences and resemblances in the plant kingdom, and is made acquainted with the salient points in plant physiology. In the spring term, fourth year, the intimate structure of plants, a more detailed study of plant physiology,—in the germination of seed, the growth of cellular substance, and the fertilization of the ovule,—variation, the improvement of varieties, parasitic fungi, are among the topics studied. A portion of this term is devoted to the principles of Landscape Gardening.

Although it is in a large degree the aim of this course in Botany to furnish a foundation for the study of applied Botany in agriculture and horticulture, the advantages of systematic observation and original investigation are kept in view; and the student anticipates the use of the text-book by the use of his eye and brain,—observing and comparing seeds, leaves, stems, flowers, and other portions of plants, keeping notes of his observations for presentation in the class. The plan is followed through the course, with each new topic. A good herbarium and series of charts are used as means of illustration.

LANDSCAPE GARDENING.—The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

HORTICULTURE.—It is the aim to teach this art from a botanical basis. The student applies his knowledge of the prime facts in botanical physiology to the various operations of the nursery, orchard and garden. The instruction is presented in a series of lectures upon the following topics, among others: The scope of Horticulture. General principles of propagation; by buds, by seeds. Production of improved varieties, by careful selection of seeds, by interfertilization of known kinds. Perpetuation of valuable sorts of fruit, by bud propagation; budding, grafting, layering, etc. The important points in nursery manipulation. The orchard; conditions of site, soil, exposure, elevation. Special treatment of the different kinds of fruit trees. Pruning; gathering and storing fruits. Small-fruit culture. Lists of varieties suitable for Kansas planting. Vegetable garden; selection and preservation of seed; planting and transplanting. The management and use of the hot-bed and cold-frame. Forest plantations. Wind-breaks. Hedges. Trees and shrubs for ornamental planting.

ENTOMOLOGY.—This science is studied with especial reference to its economical relations with agriculture and horticulture. A brief course in the principles of classification is followed by a more extended study of the life history of beneficial and injurious insects, and means of encouragement of one and the control of the other. Here, as in botany, the student is led to form a basis for the study by his own observations. The instruction is in the form of lectures. Illustrations are furnished from the individual collections of the students, from the entomological collections belonging to the Department, and detailed drawings and charts have been prepared, illustrating points of use in classification.

ZOOLOGY.—The time devoted to this study is principally given to a review of comparative anatomy and physiology. The latter portion of the term is occupied by a brief study of the system of zoological classification in present use, accompanied and illustrated by dissections and the study of fresh, alcoholic and mounted specimens.

INORGANIC CHEMISTRY.—This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Elliot & Storer.

ORGANIC CHEMISTRY.—This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. It is accompanied by laboratory practice.

CHEMICAL ANALYSIS.—In this course each student has his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.—This includes the study of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms an important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

GEOLOGY.—A term's study in the fourth year gives a view of the causes which have produced geologic changes in the past, of the general arrangement of the earth's crust, and of special peculiarities of various strata. Attention is given to the formation of soils and deposits of valuable minerals, especially in Kansas.

AGRICULTURAL CHEMISTRY.—This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

HOUSEHOLD CHEMISTRY.—A course of lectures to a class of young ladies, embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

PHYSICS.—This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical

Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.—Embracing the composition of the atmosphere; atmospheric pressure; temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

ASSAYING AND PHARMACEUTICAL CHEMISTRY may be provided for by special arrangement, when students are qualified to pursue them.

ARITHMETIC.—One term is given to a general review of arithmetic, the greater part of the time being spent on percentage and its applications. Accuracy and rapidity in computations are required. To those deficient in this respect, a thorough drill is given.

BOOK-KEEPING.—Beginning with a simple cash account, book-keeping is developed through all the principles of single and double entry. Each student provides a full set of blanks and keeps a regular set of books, in which accuracy of calculation and posting and neatness of execution are regarded as essential as correct understanding of the principles. No text-book is used, but all forms and problems are furnished in the class-room.

ALGEBRA.—Algebra is studied two terms. The first is wholly given to the literal notation. The student is thoroughly drilled in the fundamental rules, as applied to whole, fractional, and exponential quantities. The second term is devoted to the various forms of the equation and its applications. The equation in its various forms,—simple, quadratic, radical, etc.—is studied, as an instrument for solving the problems of practical life, in which quantity is an item; for demonstration of geometrical and trigonometrical theorems; and for the construction of formulas for the use of the engineer and the artisan.

Three things are aimed at in the course in Algebra: first, to train the pupil to methods of reasoning; second, to attain facility in methods of operation; third, to secure expertness in the use of algebraic formulas.

GEOMETRY.—Two terms are given to Geometry. In geometrical drawing, the student has already become familiar with geometrical forms and their construction. The first term is devoted to plane Geometry, in connection with technical drawing, involving the use of lines, angles and surfaces. During the second term, solid and spherical Geometry are studied. Practical problems, involving the principles demonstrated, are given to the class. Hand-books of engineering and of various arts are used for reference.

TRIGONOMETRY AND SURVEYING.—The principles of plane Trigonometry, involved in mensuration and surveying, are first mastered. Surveying includes theory, adjustment and use of instruments; history and methods of U. S. Government Surveys; areas of land; dividing land; retracing old lines; platting; topographical surveying; railroad surveying; leveling—section and cross section; computation of earth-work; field practice, with transit, compass, chain, level and rod; drawing and ornamentation of plans and profiles.

MECHANICS AND ENGINEERING.—A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

DRAWING.—This study is taught four terms, two of which are in the first, one in the second, and one in the third year. Students that show special aptitude in this direction are permitted to pursue the study during the remainder of the course.

First Term.—Definitions of lines and geometrical figures; judging lines and angles; construction of perpendiculars to given lines, intersecting and bisecting lines, triangles, four-sided figures and polygons, the circle and its secant lines, ellipses, and various geometrical ornaments. Prof. Walter Smith's four books on geometrical drawing are used as text-books.

Second Term.—Free-hand drawing.—After the study of numbers 3, 4 and 5 of Prof. Walter Smith's Text-books of Art Education, drawing from nature is taken up. Leaves, flowers and fruits are taken as subjects, and placed in such positions that the perspective will not interfere seriously with a correct perception of form. Each student is required to finish a set of drawings. Lectures on principles and ornamentation are given occasionally.

Third Term.—Projection of the straight line and the circle; use of drawing-board, T-square, and water colors; principles of shades and shadows; principles of parallel and angular perspective; principles of topographical drawing.

Fourth Term.—Projection of the conic sections and other regular curves; intersections of geometrical solids. Each student is required to draw and color a set of plans for a simple farm building, and another set of plans giving details of some farm machine.

ENGLISH LANGUAGE AND LITERATURE.—First Year.—The study of English Grammar is made to serve directly in clear perception and correct expression. Such practice in analysis and parsing as may give pupils a clear idea of the English sentence in all its parts, is associated with daily exercises in expression and criticism. A careful study of words and their elements,—roots, stems, prefixes and suffixes,—associating them with their origin and history, continues the course in English. Compound terms in formation and use, distinctions in synonyms, and associated meanings of words, are studied with care. Sentences are also analyzed with reference to their meaning, shades of thought, and propriety in expression. At the same time, the daily exercises are made a means of training in exact articulation, spelling, writing, and the essentials of good reading.

Principles and methods in English Composition are then taken up, with David J. Hill's Elements of Rhetoric for a text-book. Numerous exercises and revisions familiarize the students with the essentials of neat, legible, clear, and forcible manuscript.

Third Year.—A term's study of higher Rhetoric is occupied with the principles of clear explanation and convincing argument, as well as the outline of sound criticism. This is followed by a term spent in the history of English language and literature, with abundant illustrations from the best authors. Students are led in this way to appreciate the power of our mother-tongue, and at the same time to gain a slight acquaintance with the best thoughts of the world. Students are encouraged and directed in the use of the College library, and are under constant oversight in the expression of their thoughts in writing. Original declamations, carefully prepared, and delivered before the students and Faculty, make a part of the drill in the higher classes.

HISTORY AND POLITICAL ECONOMY.—The elements of United States History occupy a term's study in the first year; and special attention is given to the form and growth of the government under which we live. In the fourth year, a careful study of the Constitution of the United States is made to show the general principles of government, its means and methods, illustrated by historical references. A single term is given to the study of general history in outline, with especial emphasis upon the world's progress in science, literature and art.

The study of political economy in a full term of the fourth year, gives a fair presentation of subjects connected with production, distribution and consumption of wealth. Pains is taken to compare conflicting views, and point out sources of information on all sides of vexed questions without bias or prejudice.

LOGIC AND PHILOSOPHY.—The art of reasoning correctly is aided by a study of systematic logic, both deductive and inductive. Special prominence is given to methods for exact observation and experiment, and correct principles of classification. The previous researches and experiences of the student are made to illustrate these principles.

A short course in Psychology gives the general principles of intellectual and moral philosophy. Perception, understanding, reason, feelings and volition, are topics of explanation and analysis. Theories of right and wrong, and correct principles of action, are made the basis of a clear understanding of individual rights and duties.

SPECIAL HYGIENE.—To the ladies of the fourth year, a course of daily lectures is given by the lady superintendent of the sewing-room, upon the laws of life and health. The course continues through the entire term, and covers questions pertaining to personal health and the health of the household, such as food, air, exercise, clothing, temperature of rooms, etc.

HOUSEHOLD ECONOMY.—A series of lectures, accompanied by practical illustrations in the kitchen laboratory, continues through a term and a half. These cover the general ground of economical provision for the household,—marketing, cooking, preserving, order, neatness and beauty in table service, comfort of family, and care of a sick-room. These are supplemented by the lectures upon Household Chemistry and Dairying.

INDUSTRIAL ARTS.—The training in these departments is designed to be systematic and complete in each, so that any student following a single line diligently through a four years' course, gains the essentials of a trade and reasonable skill. Those who wish only a general acquaintance with these arts, can take shorter courses in several of them; but all are to select with definite purpose. In the regular course for farmers, agriculture and horticulture both are required as industrials during definite periods connected with their studies; certain terms of practice in the carpenter shop are also essential to readiness upon the farm. These will be adjusted to each other as improved facilities and larger classes require.

Young ladies are required to give the necessary time for practice in the kitchen laboratory, and are expected to show some facility in the practice of the sewing room, though other industrials may occupy their course. Telegraphy and printing are open to the ladies, without fees.

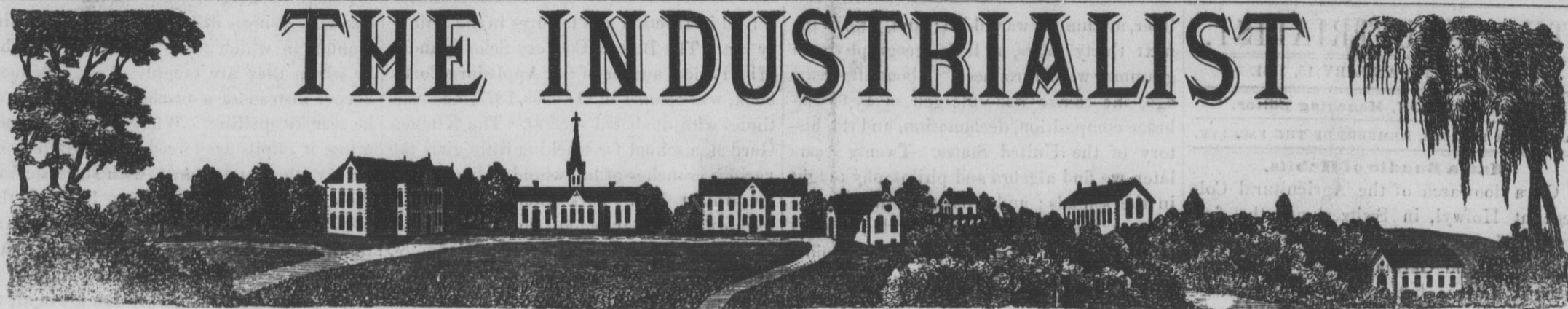
In agriculture and horticulture, the practice is made to illustrate and emphasize the teaching, and covers essentially the same ground. Training in the other arts is as follows:—

Carpentry, etc.—All are enrolled as carpenters, and take the same first lessons in sawing, planing and dressing lumber, making mortises, tenons and joints, and in general use and care of tools. Later, one who chooses a trade is provided with work directly in the line chosen, while the farmers' course provides for general training a great variety of operations, rather for ingenuity than for skill. In the full course of a carpenter, special instructions are given in the whole range of work, from the framing to the stair-building. Students are allowed, after attaining sufficient skill, to work upon their own material, under the advice of the superintendent.

Printing.—Two courses are pursued in this art. In one the student is given a general view of the rise and progress of printing, of type-founding, stereotyping, electrotyping, and lithography. He is taught the implements or tools employed in typography, and how to use them; composition; imposition; principles and practice in plain and ornamental job work; presses and their workings; technical terms; and general duties of a first-class workman. The second course, the lessons of which alternate with those in the first, embraces instruction in spelling, capitalization, punctuation, proof-reading and correction; preparation of essays and criticisms on the same; and such other miscellaneous work as will make the student accurate and expert in language.

Telegraphy.—The course of training involves for beginners the characters that compose the alphabet, and combinations of these characters into words and sentences,—attention being paid to spelling and to short and precise expressions in messages,—abbreviations, signals, forms of messages, train orders, reports, etc. To the more advanced is given regular line business; as, press releases, messages, cypher messages, and orders in all forms used by prominent telegraph companies, together with the necessary book-keeping upon exact copies of the blanks in actual use. One day in each week is devoted to instruction in the use and management of lines, batteries, instruments, etc. The elementary principles of electricity, magnetism, and electro-magnetism, involved in telegraphy, are taught and illustrated by experiments. The more rapid modes of telegraphy, including duplex, quadruplex, and the telephone, are explained.

Sewing.—Young ladies are taught in all ordinary forms of sewing with needle and machine, and in cutting, fitting and trimming dresses and other garments. They may furnish materials and work for their own advantage during the hour of practice under the direction of the superintendent.



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KANSAS STATE AGRICULTURAL COLLEGE.

SUBSCRIPTION—50 CTS. A YEAR, 10 CTS. A MONTH.

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No. 22.

KANSAS STATE AGRICULTURAL COLLEGE. MANHATTAN, KANSAS.

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THIS COLLEGE is organized to carry out the provisions of an act of Congress, approved July 2d, 1862, giving to each State public lands to the amount of 30,000 acres for each Senator and Representative in Congress, for "the endowment, support and maintenance of at least one college where the leading object shall be, without excluding, etc., * * to teach such branches of learning as are related to agriculture and the mechanic arts, * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Accordingly, every effort is made to so associate a thorough education with practical life as to increase the efficiency of labor everywhere. Science and its applications to practical arts are made prominent in the courses of instruction, and accompanied by daily direction and exercise in the arts themselves. Special attention is also given to that one essential in all education, an accurate and ready use of our mother tongue. To these are added such other branches of study as seem to develop a quick and keen observation with good judgment and sound reasoning.

FOR YOUNG MEN,

A four-years' course includes thorough drill in English; the elements of Mathematics and its applications in Surveying and Mechanics; Chemistry, inorganic and organic, in actual analysis and applied to Agriculture; Botany, Zoology, Entomology, Physiology, Physics, Meteorology, with special reference to stock-breeding, gardening and general farming, as well as direct instruction in these arts. A general acquaintance with tools and their uses and some degree of skill are gained by actual labor in the shops and fields, and habits of energy and diligence are cultivated. To these are added such general knowledge of History, Political Economy and Morals, as becomes every citizen of a free government.

FOR YOUNG WOMEN,

A parallel course affords special instruction in Household Economy and Chemistry, Hygiene and Cooking, with practical direction in Sewing, and opportunity to learn Printing, Telegraphy and Instrumental Music. Great pains is taken to give such instruction as will be an aid to efficient women in any walk of life, while opportunity is given to gain the elements of a trade for self-support.

THE TUITION

Is free. Charges are only for Instrumental Music, for materials used in Chemistry, and to young men for materials and instruments in Printing and Telegraphy.

TERMS AND VACATIONS.

The College year begins September 9th, and ends June 8th. A short vacation of two weeks includes the winter holidays. The rest of the year is divided into three unequal terms of four, twelve and eleven weeks.

Send for catalogue, to

GEO. T. FAIRCHILD, President,
Manhattan, Kansas.

Education in the Grange.

The following is the report on education, adopted by the Kansas State Grange, at its annual meeting, at Olathe, on the 21st ult.; as submitted by the standing educational committee of that body:—

To the State Grange:—

Your committee on education prepared, last March, and distributed to the granges of the State, a schedule of "Grange Lectures and Topics," as subjects for essays and discussions during the portion of the year remaining. This was done too late for very effective use before the time that the busy season cuts short such work at the meetings. Our information is, that the schedule has been considered to be sufficiently suggestive of useful topics to render it unnecessary for us to make any further recommendation in this direction at this time; leaving it for the respective granges to re-arrange the subjects in the schedule, and substitute others, as may seem best. The committee has yet copies of the schedule for distribution to such granges as may apply for them to the chairman, at Topeka. In presenting this report, your committee offers some suggestions, in the interest of the farming class, in support of a system of public industrial education which shall link in one scheme primary instruction in the district school with education in the family, in the household, on the farm, in the workshop, in the club-room, in the normal school, and in the agricultural college and university.

It has come to be an adopted theory, that education should be a life-work; that a scheme of education should prevail—as a basis of society—that shall carry systematic educational progress through from childhood to manhood and womanhood, and in them through life, with no link broken in the chain of effort of the mind in the acquirement of knowledge and in the development of capabilities for usefulness and of rational enjoyment; that education should be a unit, a graded system, embracing exercises for culture for the adult differing from those for the child only in degree,—only as those of the advanced pupil differ from those adapted for the beginner; and that, as all are, or should be, through life engaged in some employment of industry, or in the preparation for such employment, the system of education which should be adapted for all should be industrial. From the very beginning, the education of children should point to industrial pursuits. The knowledge imparted in the primary school should be such as will go into use in the employments of manhood and womanhood; or, such as will enlist thought and inquiry concerning such employments, and concerning surrounding objects in nature and art having relation to such employments. Our schools should be industrial schools.

In the use of terms, we do not intend to point to a life of unmixed toil. We do not propose that the play-ground at school shall be abolished, and that the fireside shall be

turned into a catechismal pillory; nor, that every day through life so much shall be learned from a book, and said by rote. As far from any of these as possible, is intended to be suggested.

We also realize that a large part of every child's education is acquired at home; and this education rests upon the parents as a duty which can not be delegated to others. Here, in the house and upon the farm, the child is certain to receive that bias of tastes and aspirations which will be most likely to cling to him through life. If the parent loves the farm, if he is enthusiastic in all that pertains to the advancement of his calling, if he really believes that "agriculture is the parent of all arts and the noblest," his children are certain to share his enthusiasm; and the spectacle, now so often witnessed, of the "bright boys" of the farm abandoning the calling of their fathers for the so-called "professions," will be seen no more. It is futile to talk of the incapacity of teachers, and the worthlessness of the common schools. Look into your own heart! "Have I done my duty by my children?" is the question for every parent to ask himself. If you have felt in your secret self, that, to attain a true elevation of character, that, for respectability and honorable rank in society, you must stop outside the pale of agriculture, disguise it as you may, your thoughts will be reflected in your own life, and in the lives of your children. Home influence and training, your committee is firmly of the opinion, is the great motor of "industrial education;" and, if our calling is to receive that infusion of new and youthful blood for which it now calls, it will receive it through the force of this same home training. The schools may plant and the colleges water, but without the co-operation of parents the "increase" will not be given.

In previous reports, your committee has fully set forth its views as to the work in the line of industrial education proper to our common schools. It is, perhaps, only necessary for us to say, that these views have been fully supported by our observation and experience. But, especially, we insist that, instead of constantly turning over the dead bones of grammar, and persistent mumbling of arithmetical rules, which are never used in business, our children shall receive regular instruction in the facts of plant life and growth, the nature of soils, and in the history and capacities of the various breeds of domestic animals. These seem to us practical matters indeed, and such as the tiller of the soil encounters every day of his life. It is not a pleasant thing to say, but nevertheless true, that our modern society accords the possession of a "finished education" to him who may be as ignorant of those facts of every day life as was the former painted occupant of these beautiful prairies.

The declaration of principles of the grange pledges the organization to "advance the cause of education among ourselves and for

our children, by all just means within our power;" and declares that the course of study for our agricultural and industrial colleges, should embrace instruction in "practical agriculture, domestic science, and in all the arts which should adorn the home."

The district school is the "industrial college" where the farmers' children receive their schooling, or their preparation for the Agricultural College, if perchance they are so fortunate as to reach that institution. It is the province of the grange, then, to encourage the making of the district school a true agricultural college, where such instruction as we have indicated shall be given.

In the school-room should be placed a library, and cabinets of objects illustrating the sciences relating to agriculture and horticulture; cabinets of plant forms, of insects, birds, rocks, minerals, fossils and soils. These should be collections made by the pupils themselves,—the duplicates from cabinets which such a character of education will incite them to make at their homes.

The school thus equipped, and conducted upon such a plan, will invite the presence of parents; and there the parents will themselves receive incentives to advanced reading and study in the sciences relating to their occupations, in literature, in history, and in the principles of government.

Clubs and social gatherings should form schools of a higher grade in a true scheme of education; schools organized and conducted in a manner calculated to carry forward every adult individual of the community in continued educational progress; schools where the college professor, the scientific educator, and the advanced and cultured thinker of our own class, may meet the people and give them instruction, and present before them incitements to higher intellectual improvement. The whole tendency of the educational forces of the community, so organized and conducted, will be to dignify and ennoble the farmer's occupation,—to lead to advanced thought and study, to aspirations for a higher social life, and to a determination and an ability to assert, effectively, the right of the farmer to a just participation in the affairs of the government.

The adoption of a rightful plan of education in the district schools, will necessitate the education of teachers in qualifications to impart instruction in the industrial arts. Thus, the Normal Schools, the Agricultural College and the University, will receive enlargement of their best field of usefulness; and will be enabled to better fulfill their true mission,—that of educating and elevating the people of the whole State, reaching out especially to the people of the most numerous class, the class now receiving too little benefit from these beneficent institutions of the State.

Respectfully submitted.

F. G. ADAMS,
E. M. SHELTON,
S. A. FELTER,
Committee.

THE INDUSTRIALIST.

SATURDAY, JANUARY 15, 1881.

E. M. SEHLTON, Managing Editor.

ASSOCIATE EDITORS, MEMBERS OF THE FACULTY.

Man a Bundle of Habits.

On a door-arch of the Agricultural College at Hofwyl, in Switzerland, the first school of the kind ever established, is engraved, in bold German letters, the inscription: "Man is but a bundle of habits." Though not original with Herrn Fellenberg, the generous founder of the institution, this motto became the base of every one of his plans in the field of education; and his grand success proves that it was a center shot. The good old usage of ornamenting house-fronts with wise sayings, has passed away, or I would move to pencil this old saw upon the door-cap of every school-house in the land.

Is it a wonder that the student who completes the high-school course at eighteen, seldom willingly enters the workshop as an apprentice, with the intention of becoming a skilled mechanic, and earning his livelihood by manual labor. These ten or twelve years of mental school-work, whether highly successful or not, have, through habit, unfitted him for all manual work, even if he has not, in many ways, been taught to despise labor. Is it a wonder that the student who leaves the university at twenty or twenty-five, shuns all manual labor for a life-time? Is it a wonder that the young and accomplished (?) lady graduate of Mrs. Grundy's boarding-school, "can not endure cooking," and scouts at the idea of making her own clothes? Is it a wonder if even the common-school graduate becomes a hungry peddler, horse-trader, or back-woods preacher, in preference to a solid mechanic, or a well-to-do farmer?

Fellenberg's motto gives us the answer: "Man is but a bundle of habits." It is quite natural that a child should learn to despise work, if sent to a school where literature, and a long list of so-called social accomplishments, form the programme of studies, to the nearly entire exclusion of science and practical arts,—where he will not only cease to work, but constantly hear labor spoken of as drudgery, and laborers as the *pariah* of the nation.

Manual labor and the teaching of trades must fall within the province of industrial institutions. But public education might touch practical life in a large number of points: it should better fit the seventy-five per cent of people that have to live by work, for their different spheres in life. Education should not be lowered, but it should be based upon those elements which may serve the double purpose of mental culture and discipline. It should cease to cull its ideals of manhood exclusively from the bloody pages of history or the dusty cyclopedias of literature; for, even in the selection of ideals, "man is but a bundle of habits." Prof. Swing says: "A school which breeds an intellectual vanity, and makes all the girls and boys of a town or city long to be poets or historians or lawyers or orators or statesmen and millionaires, is very narrow and false; but broad and just and true is the public institution which so sets forth the ethics of labor that all industry,—at the desk, or in the shop, or behind the plow,—will seem like the acceptance of a call from God and humanity."—Prof. Walters.

Common-school Curriculums.

At the time of the adoption of the Constitution, the course of study in the common schools of this country was confined to reading, writing, and spelling. A few years

later, arithmetic was added; and, within the next thirty years, a little geography and grammar were introduced. About fifty years ago, the course was enlarged so as to embrace composition, declamation, and the history of the United States. Twenty years later, we find algebra and philosophy taught in the schools; and, from that time to the present, the course has been widened so as to include physiology, botany, book-keeping, astronomy, music and drawing. And the question now comes, Is this process of widening the course of study to continue; or have we passed the limit of wisdom in this respect, and shall we begin to narrow it down? In other words, are we spreading our common-school instruction over so much ground that it is quite too thin in spots; and would it be better to cover a little less surface, and spread it on considerably thicker?

I am inclined to answer these questions in the affirmative. The field of knowledge is so broad that no one in a life-time can learn but a small part of a very few sciences. Is it not, then, better for our children, while in the common schools, to learn a few things, and learn them well, than to try to learn a little of everything?

Take the subject of reading, for instance. There are so many other studies to be taught, that reading probably occupies not more than one-fourth the time of the teacher that it did thirty or forty years ago. To be sure, our books are better adapted to the purpose of teaching reading than they were then, and it ought not to require so long a time to produce a good reader; but the fact is, very few pupils now leave our public schools who are good readers.

To read well orally is a very fine accomplishment, in order thus to give pleasure and information to others; but that is not so important as is the ability to perceive quickly the ideas of an author, and, at the same time, to weigh them correctly. Most persons are so occupied with the business of life, in this busy age, that they have but a limited time each day or week to devote to reading; and, if they imbibe ideas slowly, but little is accomplished. There is a world of reading, giving us valuable information, now at our hands; and our children need the power to go through a newspaper or book with some rapidity, retaining those thoughts that are worth keeping and letting the rest go. They also need that discipline of mind that enables them to judge correctly of the value of thoughts thus read. With these qualities and a love for reading, which comes, in a great measure, from the ability to do it well, a good foundation is laid for an after-education.

Let us not, then, so contrive to widen the scope of common-school study, that the very elements of a good education are neglected.—Prof. Platt.

Cookery.

There are two arts on which human society depends for the necessities of life more directly than upon all others,—agriculture and cookery. While the former has received some attention for several decades, by founding agricultural colleges and experimental stations, organizing societies, distributing seeds, etc., the latter has thus far been entirely neglected; and national custom does not, and never did, tend to correct the deficiency. It is only very recently that a movement in this direction has been inaugurated. This beginning, however, is very promising.

The first institution started in the United States for the purpose of teaching cookery, was the New York Cookery School, founded in 1874. In 1877-8, 1,200 persons re-

ceived instruction and lectures in the culinary art. The Boston Cookery School, under Miss Parloa, author of the *Appledore Cook-book*, was opened in October, 1877, and continues with unabated success. The Kitchen Garden, a school for teaching little girls the various branches of household industry, was founded at New York City, in 1877. A number of similar schools have, with great success, been started in Brooklyn, Baltimore, and other cities.

From a report of the New York Kitchen Garden, we quote the following:—

"The instruction is embodied in six lessons, requiring one month's application each, and comprehending the following details of domestic work: kindling fires, waiting on the door, and bed-making; sweeping and completely arranging a room, with the manipulations of broom, whisk broom, feather duster, etc.; all laundry processes, from the preparation of the tubs, to the delicacies of polishing and folding; scrubbing, and laying a dinner table in the due order of different courses, in connection with which, a pricking lesson teaches, in Kindergarten style, the parts of beef and mutton, and how to cut and cook each; last of all comes the mud-pie play. In this crowning device of the inventress of the system, with moulding clay as a substitute for dough and pastry, the children knead bread, turn tiny rolls, cut out biscuit, and make pies. All the lessons are enlivened and emphasized by appropriate songs. Thus, under loving guidance, with the simple device of toy appliances for real domestic apparatus, these children of poverty acquire the order, precision, and neatness essential to household service."

Last, but not least, we will mention the departments of household economy and practical cookery, which have been organized at the Iowa and Kansas State Agricultural Colleges.—Prof. Walters.

Variety of Studies.

Every educator knows how difficult it is to keep the pupils, for any great length of time, interested in one thing, however well they may like it on the whole. When their interest is gone, there is no improvement, but disgust for school springs up. Pedagogue Locke, in speaking of the necessity of varied exercises in school, said that a boy would soon tire of the sport, if he were required to spin his top for a stated number of hours at the same time each day. There should be a sufficient variety of studies to give children an interest in their work; and, because there is not now enough variety in primary schools, a good part of the time of pupils is more than wasted, and many are disgusted and driven away.

All early education should tend to develop the mind and character of the child. No capabilities should be entirely neglected while others are developed. Therefore a variety of studies or of exercises is wholesome. Nearly every department of knowledge has features which are adapted to the minds of children, and which can often be better learned in childhood than at any later period. Take drawing and the natural sciences. Drawing deals with visible lines and forms. Drawing cultivates taste, confers manual dexterity, and develops the inventive powers; while natural science deals with facts and phenomena, instead of words and abstract statements. Better than any other study adapted to childhood, natural science teaches to compare, to generalize, and tabulate,—the very processes which the mind will be occupied with most in all systematic thinking. That the teaching of these subjects should not go beyond the comprehension of the pupil, is a necessary provision.

A greater variety of studies does not necessarily imply cramming. There may be just as much cramming with a few as with many studies. "A glutton may be glutton-

ous with a single dish." It depends on the manner in which these things are taught, by whom they are taught. Take a school-keeper instead of a teacher. Observe how he teaches spelling. What is it but cramming, if pupils are forced to spell fifteen or twenty thousand words without knowing their meaning, and without heeding the laws of orthography, when they never will, in all their life, use more than three or four thousand, and those the most common. Is it not cramming, when children are made to memorize long rules and formulas in arithmetic, which they do not, and cannot at that age be expected to, comprehend.

With the introduction of these new studies, more of the child's powers would be developed, a more symmetrical mind would be formed, and there would also be a more practical citizen educated. Many children could be sent to school longer if parents could see in school these new studies which have a direct bearing upon daily life. At present, more school simply means more grammar, more arithmetic, and more geography, with spelling everlastingly.—Prof. Walters.

Educational Gossip.

In the last two years, 69 pupils have been educated at the Kansas Blind Asylum, at an expense of \$207 each.

The educational fund of Bourbon county has received \$531.70 as a legacy of a man dying in the poor-house.

State Superintendent H. C. Speer has moved his family from Junction City to Lawrence, his former home.

It costs \$7.50 a day to furnish the public schools of Galena with apples. The *Republican* has been making the calculation.

A gentleman of this county, whose wife is a graduate of an agricultural college, never tires of praising such schools. He says that his wife can play the sweetest kind of tunes on a washboard; and she makes such nice bread that, if he decided every morning after breakfast to leave her, he would be sure to come home before dinner.—*McPherson County School Journal*.

The most pleasant affair of the season was a supper given by the grammar, intermediate, and high school departments of our city schools, last Thursday evening. Prof. McBride was the recipient of Chamber's English Literature from the pupils. A. W. McCandless, of the intermediate, received "Gibbon's Rome." The teachers have reason to be proud of their pupils, and vice versa.—*Hutchinson Herald*.

Many have supposed that the pronunciation of Arkan-s-a-w, as used by natives of that State and made familiar by the story of the "Arkansaw Traveller," was a mere vulgarism; but it is the true, ancient, scholarly and correct pronunciation. So says President Porter, of Yale College, who is good authority; and so says the Arkansas State Historical Society, which must be considered the very best authority.

The Catholics of Atchison are showing a good deal of energy in educational matters. They have a college for male students, with an attendance of 95; and an academy for female students, with 130 pupils enrolled. Both, St. Benedict's College and the Academy of St. Scholastica, are under the care of the St. Benedict's order. The latter possesses, with the exception of the State University, the most costly educational building in the State.

Prof. D. J. Evans, who is now at Washington City, in the Census Bureau, makes this statement of the population of Kansas:

Male.....	536,077
Female.....	459,253
Native.....	885,707
Foreign.....	199,628
White.....	951,546
Colored.....	43,789
Chinese.....	19
Indians.....	693
Half-breeds.....	104
Siamese.....	3

Total.....995,335

It will be seen that there are 76,819 more males than females in this State. An exodus of the "gentle sex" from the eastern States into Kansas, might have a cheering influence on the old bachelors, and young men too.

THE INDUSTRIALIST.

SATURDAY, JANUARY 15, 1881.

A new barb-wire fence will soon surround the east twenty acres of the old College farm.

203 students, from 40 Kansas counties and six States, is not a bad showing for the second week of the term.

Prof. Shelton delivers an address at the installation of officers of Capital Grange, Topeka, on Saturday, Jan. 22d.

Monster classes of well-behaved students, every one of whom is at work with a full head of steam, was the gist of department reports at the Faculty meeting yesterday.

The little King Philip corn, of which the INDUSTRIALIST has made occasional mention, comes to the front this year with a yield of over 60 bushels per acre; the same being grown on thin, upland, prairie soil.

From a brief examination of the wheat-fields, we conclude that a good deal of the late-sowed wheat is badly injured by this severe winter. That which was sowed early and became well rooted before winter set in, is apparently uninjured.

An enterprising young man reports having counted 32 frozen ears and noses, when on his way to chapel Thursday morning. Whether these injured appendages were found scattered by the roadside, or worn by their owners, is not reported.

The Fifth Annual Meeting of the Kansas State Historical Society will be held in the Senate Chamber, at Topeka, on Tuesday evening, January 18, 1881, for the election of members of the Board of Directors, and the transaction of other business. Members of the Society are requested to attend.

The "oldest inhabitant," with a low bow and a tug at the wisp of gray hair which adorns his ample brow, announces that this is the "coldest winter," etc. But, as he has made similar statements of every phase of the weather during the past seventeen years, we are forced to consider him a venerable fraud, with a weak memory and a loose tongue.

Alpha Beta Society called to order, with President Lightfoot in the chair. In the examination of officers, the committee was very thorough; but the officers acquitted themselves creditably, and all were reported as qualified, by the committee. An eloquent valedictory was given by the ex-president, in which the work of the term was reviewed. President Jeffery followed with an inaugural, which was a warm appeal to the members for their hearty co-operation during the coming term. The Gleaner was presented by F. M. Jeffery and Rebecca Coburn. Several of our old members are here this term; and we anticipate a thriving period of the Society.

So far this term, 203 students have been enrolled. These come from 40 Kansas counties, and six States; namely, Indiana, Iowa, Illinois, Michigan, Ohio, and Missouri. Below we give the representation from each county and State:—

Allen.....	1	Mitchell.....	3
Anderson.....	3	Nemaha.....	1
Bourbon.....	1	Osborne.....	2
Butler.....	4	Ottawa.....	1
Chase.....	5	Pottawatomie.....	7
Chautauqua.....	1	Rice.....	1
Cherokee.....	8	Riley.....	58
Clay.....	8	Rush.....	1
Clark.....	1	Saline.....	4
Coffey.....	1	Sedgewick.....	2
Cowley.....	4	Shawnee.....	11
Davis.....	5	Smith.....	1
Dickinson.....	1	Trego.....	1
Doniphan.....	15	Wabunsee.....	15
Franklin.....	1	Washington.....	5
Greenwood.....	3	Wilson.....	1
Jackson.....	5	Wyandotte.....	1
Jefferson.....	8	Indiana.....	1
Jewell.....	8	Iowa.....	1
Leavenworth.....	2	Illinois.....	1
Lyon.....	4	Michigan.....	2
Marion.....	1	Missouri.....	2
McPherson.....	3	Ohio.....	1

SOCIETY HALL, Jan. 8th, 1881.

The Webster Society was called to order at the usual hour, President Thompson being in the chair. After devotion, the Society proceeded to the election of officers. Officers for the ensuing term are: W. S. Myers, President; M. T. Ward, Vice-President; H. L. Call, Secretary; R. A. Holenberg, Treasurer; Warren Knaus, Critic; W. C. Palmer, Librarian; and Geo. F. Thompson, Marshal. The names of Grant Selby and Mr. Houston were balloted on for membership. Debate, conducted by Messrs. Reeve and Sloan on the affirmative and Messrs. Myers and Palmer on negative, was discussed with usual spirit and energy. The Reporter was not presented, to the evident regret of both members and visitors. The names of E. C. Anderson, J. C. McElroy, and James Rogers, were proposed for membership. After assignment of duties, the Society adjourned. This

meeting opens another term, which promises to be one of unusual interest and activity. Visitors, and especially new students, are cordially invited to attend.

CALL.

THE BOARD MEETING.

The regular quarterly meeting of the Board of Regents continued from Thursday morning to Saturday afternoon, Jan. 6th to 8th. All were present except Regent Challiss.

Reports were received from Regent Redden, Attorney for the Board; Regent Purcell, Treasurer; and L. R. Elliott, Land Agent. The last two were referred to committees for auditing, and passed to the Secretary for summary in record. The Secretary's books were also submitted to the Board for approval.

Certain cases of delinquency in payment for lands were considered and settled.

Upon the application for assistance from the College in a farmers' institute at Abilene, it was resolved that the College take part in not more than four institutes this winter, in such places as provide for all local expenses and at least one-half of the programme of exercises, and that Regents Purcell and Fairchild be a committee to apportion the work among members of the Faculty.

At a joint meeting of Board and Faculty, the condition and wants of the several departments were presented by the members of the Faculty, all of whom were present.

Expenditures were authorized for the following: catalogue of library; frames for certain pictures belonging to the College; catalogue of College stock; fence about field near old College; seeds, trees, stocks, and plants, for Horticultural Department; bottles, chemicals, and cabinet case for Laboratory; materials for practice in Sewing and Cooking Department; another instrument in the Music Department; grindstone and heater for carpenter shop; blanks, machines and wire for telegraph office; and a re-arrangement of rooms for music, sewing and cooking.

The charge to students in chemistry for their outfit-in analysis, was fixed at \$3, to be paid in advance.

The Loan Commissioner was directed to invest the endowment fund of the College in any safe bonds.

The bills of last quarter were audited, approved, and passed into the Treasurer's hands for payment.

Application was made to the U. S. War Department for detail of Lieut. Albert Todd, First Artillery, U. S. A., as instructor in military tactics, provided he shall receive no compensation from the College funds.

Regents Redden and Fairchild were appointed a committee to secure an orator for the Commencement address.

The Faculty were authorized to issue the annual catalogue on or before Commencement day.

The general necessities of the College, as to buildings and equipment, on account of increasing attendance, and feasible plans for extending the influence of the College in the interests of agriculture and horticulture throughout the State, occupied the attention of the Board. The condition and prospects of the College gave satisfaction, though many wants must remain unsupplied, for lack of funds. The Secretary was ordered to publish the financial statement settled by the present auditing of accounts.

Board adjourned to meet at call of President.

Through the kindness and with the compliments of President Fairchild, we are in receipt of the report of the Agricultural College, at Manhattan. At the outset, we will say that we consider this the best-managed and most successful Agricultural College in America; and Kansas may well feel proud of it. Until we watched the working and the result of this school, we had always pronounced such schools a failure; but this one is a complete success.—Lincoln County Register.

The second biennial report of the State Agricultural College shows this institution to be in a very satisfactory condition. In 1878-9 the whole number of students in attendance was 207,—151 males and 56 females. In 1879-80 the number increased to 203 males and 73 females; making a total of 276, an increase of 71. I respectfully invite your special attention to that portion of the report in reference to an alleged diminution of the endowment fund, with a request that such action be taken in relation to the matter as, in your judgment, a due regard for the rights of the institution may warrant.—Governor's Message.

The Legislature will be petitioned this session for an appropriation to build another wing to the main college building. The demand for more room is apparent to all who visited the institution the past term; and it is an absolute necessity for the accommodation of proud young Kansas' ambitious young men and women, who are rapidly manifesting an eagerness to avail themselves of the facilities which this institution affords for acquiring a practical education, and thereby enable them to enjoy the privileges that accrue from a higher and nobler plane of intellectual existence.—Winfield Courier.

ENTERING COLLEGE.

Candidates for admission at the beginning of the fall or winter term, must be at least fourteen years of age, and able to pass a satisfactory examination in reading, spelling, writing, arithmetic

to percentage, geography, and the elements of English grammar. Those applying later in the term must show sufficient advancement to enter the classes already in progress. Every effort should be made to begin with the first day of the term, in order to advance with the classes from the first.

Applicants for advanced standing in the course must pass examination in all the previous studies of the class to be entered; but, if they have pursued such studies in other institutions of similar rank, they may receive credit for their standing in those institutions upon presenting a certificate from the proper officer.

All applications should be made to the President of the College, who will furnish information as to rooms and boarding places as well as college duties.

Students should bring letters of recommendation from home, or from the school last attended, that they may at once find friends, if possible, in this their new home.

Upon arriving, each should leave bulky baggage at the depot until a boarding place is secured, and at once enquire for the President's office at the College. Not an hour should be lost in completing arrangements for immediate work. Having found a place to live, each student, new or old, is expected to notify the President where his room is.

Not a day should be lost from the classes, if arrangements are possible without it.

EXPENSES OF THE COURSE.

Tuition is free, and no charges are made for incidental or "contingent" expenses.

Students in chemistry pay for the chemicals used by them in their laboratory practice and analysis, at cost prices.

Young men who take printing or telegraphy for their industrial, pay one dollar a month for the use of office and instruments. Young ladies are furnished these free, these two offices with the sewing and cooking departments being provided especially for their industrial education.

All other instruction furnished by assignment to classes is without expense to the student, beyond the necessary text-books. These can be procured at Manhattan at a cost of from two to five dollars a term. Those wishing to procure books before coming can learn what are used by inquiry.

Instrumental music is taught at the College in private lessons or small classes at the following

Prices per week:

Private lessons, 2 a week, on any instrument, \$1.00
Private lessons, 1 a week, on any instrument, .60
Class lessons, 2 a week, on any instrument, .65

This includes the use of the instrument. Instruction in harmony, etc., is furnished at from ten to fifty cents per weekly lesson, as the student may or may not receive other lessons.

Board and washing are not furnished by the College. Board can be procured in private families at from \$2.75 to \$3.50 per week, and in some boarding houses for \$1.50 per week. Some students board themselves at even less cost; and rooms for that purpose can be obtained at a rent of from \$1.50 to \$2.50 a month. Washing costs from fifty cents to one dollar a dozen pieces.

All personal expenses are made light by the spirit of economy pervading the Institution. Expenses, aside from clothing, range from fifty to one hundred and fifty dollars a year. These there is some opportunity to reduce by

EARNINGS.

The labor of students in the industrial departments is principally a part of their education, and is not paid for, unless the student is employed—outside of required hours of labor—upon work for the profit of the College. Some students are so employed upon the farm, in the gardens or the shops, and about the buildings. This labor, in limited quantities, is paid for at rates, varying with service rendered, from seven to ten cents an hour.

Many students obtain work in the village or upon neighboring farms, and so pay a part of their expenses. Students who work in the shops are allowed to work somewhat for their own profit in manufacture of articles for sale or use. In these ways a few students are able to earn their way through College. The amount so earned will vary with the taste and zeal of the student. The majority must expect to provide by earnings outside of term-time or from other sources for the larger part of their expenses.

COLLEGE BUSINESS.

THE INDUSTRIALIST may be addressed through Prof. E. M. Shelton, Managing Editor. Subscriptions are received by Sup't A. A. Stewart.

DONATIONS for the Library or Museums should be sent to Prof. Ward, Librarian, or to Profs. Failor and Popenoe, committee on Museums.

BILLS against the College should be presented monthly to the several heads of departments, or to the Secretary of the Board, at the College.

PAYMENTS on account of College funds, and from the College on approved bills, are made at the office of E. B. Purcell, Treasurer, in Manhattan.

QUESTIONS, scientific or practical, concerning the different departments of study or work, may be addressed to the several Professors and Superintendents.

GENERAL INFORMATION concerning the College and its work,—studies, examinations, grades, boarding places, etc.,—may be obtained at the office of the President.

LOANS upon school-district bonds are to be obtained from M. L. Ward, Loan Commissioner, who will furnish all necessary blanks and papers. Residence, Manhattan.

COLLEGE LANDS and all business connected with their sale are in charge of L. R. Elliott, Agent. Full particulars with descriptive map will be furnished upon application at his office, in Manhattan.

COLLEGE SOCIETIES.

ALPHA BETA.—Chartered, December 26th, 1870. Meets in the Society Hall every Friday at 2 p. m. Ladies admitted. New students cordially invited to attend.

W. J. JEFFERY, President.

MISS MAY QUINBY, Secretary.

WEBSTER.—Chartered, January, 1871. Meets in Society Hall every Saturday evening. Visitors, especially students, always welcome.

WIRT S. MYERS, President.

H. L. CALL, Secretary.

SCIENTIFIC CLUB.—Meets on first Friday evening of each month. Composed of members of the Faculty and advanced students. Devoted to the improvement of its members in general scientific knowledge, and the encouragement of original investigations.

I. D. GRAHAM, President.

G. H. FAILYER, Secretary.

MANHATTAN CARDS.

W. C. Johnston,

DRUGGIST.

Opposite post-office. Established, 1859.

Bookseller and Stationer.

S. M. FOX.

Fine Stationery, Pocket-Books, Gold Pens, Envelopes, Blank Books, etc. No. 127, Poyntz Av.

Clothier.

WM. KNOTSMAN.

Ready-made Clothing, Hats, Caps, and Gents' Furnishing Goods. Opposite post-office.

Barber Shop.

P. C. HOSTRUP.

Don't fail to call, if you want a good, easy shave, a first-class hair-cut, or a good bath. Shop opposite Purcell's store.

Long & Firestone.

LIVERY, FEED AND SALE STABLE.

East end of Poyntz Avenue.

Warren Cooper.

DRY-GOODS AND GROCERIES.

Southeast corner Poyntz Avenue and Second St.

Burgoyne's

PHOTOGRAPH GALLERY.

Established, 1859. Opposite Purcell's bank.

Stingley & Huntress.

DRY-GOODS, GROCERIES, AND IMPLEMENTS.

Two doors east of post-office.

City Expressman.

A. ADAMS.

Does a general delivery business. Conveys passengers to and from College. Round trip, 25 cts.

Hardware, Tinware, &c.

A. J. WHITFORD.

Handles everything in his line. Four doors west of post-office.

Mrs. Briggs' Bazaar.

The young ladies of the College are especially invited to call and examine my stock of goods, and get my prices, before purchasing elsewhere.

Manhattan Bakery.

WM. BALDERSTON.

Bakery on Second Street, three doors north of Poyntz Avenue.

A. P. Mills, Successor to Blood, Brooks & Co.,

GROCER, CONFECTIONER,

AND SHIPPER OF PRODUCE OF ALL KINDS.

Poyntz Avenue, opposite post-office.

S. Pillsbury,

BOOTS AND SHOES, Exclusively.

Sells for cash, and aims to give good goods and good bargains to all. Opposite post-office.

Merchant Tailor.

WM. B. LEICESTER.

A good stock of fashionable goods always on hand. All work warranted. Opposite post-office.

R. E. Lofineck.

MUSICAL MERCHANDISE.

YOUR CHOICE, FOR 10 CENTS, of a fine display of jewelry and notions. Opposite post-office.

Manhattan Bank.

E. B. PURCELL,

J. W. WEBB, Cashier.

Banker.

A general banking business transacted. Bills of Exchange issued on all principal cities and towns of Europe. All collections have the personal, faithful and prompt attention of our attorney. Proceeds remitted promptly, at current rates of exchange, without any charge of commission.

KANSAS STATE AGRICULTURAL COLLEGE.

THE COURSE OF STUDY.

The necessity for so adjusting various branches of study that there shall be as little waste as possible in acquiring both information and discipline, is felt by every teacher. For this reason, almost all schools offering a real education present some well-defined arrangement for progress in studies, and call it a course. Such a course is not designed to be absolutely inflexible, but to guide towards a fair judgment of some definite line of progress from which no mere whim shall turn a student aside.

With such views, this College offers a general course of study, designed to promote genuine knowledge and thorough discipline, so far as it may extend. With the studies here laid down, there will always be sound training in morals and social proprieties, and some drill in elocution. Carefully adjusted to its different parts, are courses of training in the industrial arts. Agriculture, Horticulture, Carpentry, Printing, Telegraphy, Sewing and Cooking, are especially provided for. Some one of these each student is required to practice, being allowed a choice with advice from the Faculty. Instrumental and vocal music, though not a part of the curriculum, find a place in the general machinery.

Parallel courses are offered to both sexes, with such differences as their necessities seem to call for. The following outline gives the general scope of the two; but fuller explanations are found elsewhere:—

GENERAL COURSE OF STUDY.

FIRST YEAR.	FALL TERM.	Arithmetic. English Structure. Geometrical Drawing.
	WINTER TERM.	Book-keeping. English Analysis. United States History.
	SPRING TERM.	Algebra. English Composition. Botany, with Drawing.
SECOND YEAR.	FALL TERM.	Algebra. Elementary Chemistry. Horticulture.
	WINTER TERM.	Geometry, with Drawing. Practical Agriculture, or Household Economy. Organic Chemistry. Mineralogy.
	SPRING TERM.	Geometry. Entomology. Anatomy. Analytical Chemistry, or House- hold Chemistry and Economy.
THIRD YEAR.	FALL TERM.	Trigonometry and Surveying. Physiology. General History.
	WINTER TERM.	Mechanics, with Drawing. Agricultural Chemistry. Rhetoric.
	SPRING TERM.	Civil Engineering. Chemical Physics. English Literature.
FOURTH YEAR.	FALL TERM.	Agriculture, or Special Hygiene. Meteorology. Psychology.
	WINTER TERM.	Logic, Deductive and Inductive. Zoology. United States Constitution.
	SPRING TERM.	Geology. Botany and Gardening. Political Economy.

DEPARTMENTS OF INSTRUCTION.

PRACTICAL AGRICULTURE.—Second Year.—History of agriculture, showing the successive steps by which the art has attained its present position. History and characteristics of breeds; their adaptations to the varying conditions of soil, climate and situation; the relation of stock-raising to general farming. Cultivation of food crops; management of corn and roots in reference to stock-feeding and the growth of the finer grains. The best sorts for the State, and their management, as shown by experiments on the College farm and elsewhere. Implements of simple tillage; mechanical principles involved in their construction. Application of labor. Draught; different adjustments, as affecting draught. Use of the dynamometer. Plows for soil and subsoil. Planning farm buildings, barns, pigsties and stables. Draining; soils that need draining; how to lay out a system of drains.

Fourth Year.—General principles governing the development of domestic animals.—The laws of heredity of disease,—of normal, abnormal and acquired characters; atavism; correlation in the development of parts; in-and-in breeding and cross breeding; influences affecting fecundity; study of the forms of animals, as shown by the different breeds belonging to the College. The selection and arrangement of the farm with reference to the system to be pursued. Rotation of crops; general advantage of a rotation; the best rotation for distribution of labor, production of manure, and extermination of weeds. Manures; how best housed and applied; composting; commercial fertilizers. Agricultural experiments; field and feeding experiments. Stock-feeding and meat production; stall-feeding; soiling.

ANATOMY AND PHYSIOLOGY.—Third Year.—The study of Physiology is preceded by a course of lectures on anatomy. In this course, such consideration will be given to the form, structure and location of the different organs as is required for the proper comprehension of Physiology and Hygiene; and, in addition, the external form of domestic animals, particularly the ox and horse, will be studied by the class as a preparation for the study of Stock-breeding. The study of Physiology embraces a thorough consideration of the functions of the organs of the human body, and the relations these sustain to the condition of health and disease. Among the principal topics discussed, these may be mentioned: foods and digestions; assimilation; secretion and excretion; the circulation of the blood; the nervous system; the special senses; reproduction.

BOTANY.—During the course, two terms are given to the study of Botany. In the spring term, first year, the student is familiarized with the basis and aims of the botanical classifications to a sufficient degree to enable him to appreciate differences and resemblances in the plant kingdom, and is made acquainted with the salient points in plant physiology. In the spring term, fourth year, the intimate structure of plants, a more detailed study of plant physiology,—in the germination of seed, the growth of cellular substance, and the fertilization of the ovule,—variation, the improvement of varieties, parasitic fungi, are among the topics studied. A portion of this term is devoted to the principles of Landscape Gardening.

Although it is in a large degree the aim of this course in Botany to furnish a foundation for the study of applied Botany in agriculture and horticulture, the advantages of systematic observation and original investigation are kept in view; and the student anticipates the use of the text-book by the use of his eye and brain,—observing and comparing seeds, leaves, stems, flowers, and other portions of plants, keeping notes of his observations for presentation in the class. The plan is followed through the course, with each new topic. A good herbarium and series of charts are used as means of illustration.

LANDSCAPE GARDENING.—The lectures on Landscape Gardening not only unfold the accepted principles of the art, but at the same time give special attention to such applications of the art as may be made universally available in laying out and improvement of farms and the homes of the people. These lectures are accompanied by a practical drill in the work of laying out and plotting grounds topographically.

HORTICULTURE.—It is the aim to teach this art from a botanical basis. The student applies his knowledge of the prime facts in botanical physiology to the various operations of the nursery, orchard and garden. The instruction is presented in a series of lectures upon the following topics, among others: The scope of Horticulture. General principles of propagation; by buds, by seeds. Production of improved varieties, by careful selection of seeds, by inter-fertilization of known kinds. Perpetuation of valuable sorts of fruit, by bud propagation; budding, grafting, layering, etc. The important points in nursery manipulation. The orchard; conditions of site, soil, exposure, elevation. Special treatment of the different kinds of fruit trees. Pruning; gathering and storing fruits. Small-fruit culture. Lists of varieties suitable for Kansas planting. Vegetable garden; selection and preservation of seed; planting and transplanting. The management and use of the hot-bed and cold-frame. Forest plantations. Wind-breaks. Hedges. Trees and shrubs for ornamental planting.

ENTOMOLOGY.—This science is studied with especial reference to its economical relations with agriculture and horticulture. A brief course in the principles of classification is followed by a more extended study of the life history of beneficial and injurious insects, and means of encouragement of one and the control of the other. Here, as in botany, the student is led to form a basis for the study by his own observations. The instruction is in the form of lectures. Illustrations are furnished from the individual collections of the students, from the entomological collections belonging to the Department, and detailed drawings and charts have been prepared, illustrating points of use in classification.

ZOOLOGY.—The time devoted to this study is principally given to a review of comparative anatomy and physiology. The latter portion of the term is occupied by a brief study of the system of zoological classification in present use, accompanied and illustrated by dissections and the study of fresh, alcoholic and mounted specimens.

INORGANIC CHEMISTRY.—This course is opened with a careful study of chemical forces and the laws governing chemical combination. The elements, with their compounds, are next considered in succession as to their history, properties, manufacture, and especially their uses on the farm and in the arts. These lectures are accompanied by an extended course of laboratory practice, in which each student performs every experiment with his own hands. Text-book, Elliot & Storer.

ORGANIC CHEMISTRY.—This comprises a thorough study of the chemistry of the organic compounds, the composition of plants and of the various compounds derived from them. It is accompanied by laboratory practice.

CHEMICAL ANALYSIS.—In this course each student has his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. He here performs analyses of farm soils, plant ash, commercial manures, ores, mineral waters, commercial compounds, etc. After completing this course, he enters, if he desires, the Quantitative Laboratory, where he pursues a full course in quantitative analysis. Text-book, Kedzie's Manual.

MINERALOGY.—This includes the study of crystallography, with the properties, forms and uses of the principal minerals of the United States. Blow-pipe analysis forms an important part of the course, each student being required to name and identify a large series of minerals. Text-book, Dana's Mineralogy.

GEOLOGY.—A term's study in the fourth year gives a view of the causes which have produced geologic changes in the past, of the general arrangement of the earth's crust, and of special peculiarities of various strata. Attention is given to the formation of soils and deposits of valuable minerals, especially in Kansas.

AGRICULTURAL CHEMISTRY.—This includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification and composition of soils; the analysis of soils and their adaptation to purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining, etc. Text-book, Johnson's "How Crops Feed."

HOUSEHOLD CHEMISTRY.—A course of lectures to a class of young ladies, embraces the chemistry of cooking; the composition of food; bread; tea, chocolate and coffee; butter and milk; ripening and preservation of fruits, etc.

PHYSICS.—This includes a full consideration of the laws of mechanics, of liquids, gases and vapors, weights and measures, and specific gravity, followed by experimental study in the Physical

Laboratory of the laws of heat, light, with spectrum analysis, electricity and magnetism, and the relation of these forces to plant and animal life.

METEOROLOGY.—Embracing the composition of the atmosphere; atmospheric pressure, temperature and humidity; laws of storms; rain, snow and atmospheric electricity. A full course in meteorological observations is taken under direction of the Signal Service. Text-book, Loomis' Meteorology.

ASSAYING AND PHARMACEUTICAL CHEMISTRY may be provided for by special arrangement, when students are qualified to pursue them.

ARITHMETIC.—One term is given to a general review of arithmetic, the greater part of the time being spent on percentage and its applications. Accuracy and rapidity in computations are required. To those deficient in this respect, a thorough drill is given.

BOOK-KEEPING.—Beginning with a simple cash account, book-keeping is developed through all the principles of single and double entry. Each student provides a full set of blanks and keeps a regular set of books, in which accuracy of calculation and posting and neatness of execution are regarded as essential as correct understanding of the principles. No text-book is used, but all forms and problems are furnished in the class-room.

ALGEBRA.—Algebra is studied two terms. The first is wholly given to the literal notation. The student is thoroughly drilled in the fundamental rules, as applied to whole, fractional, and exponential quantities. The second term is devoted to the various forms of the equation and its applications. The equation in its various forms,—simple, quadratic, rational, etc.—is studied, as an instrument for solving the problems of practical life, in which quantity is an item; for demonstration of geometrical and trigonometrical theorems; and for the construction of formulas for the use of the engineer and the artisan.

Three things are aimed at in the course in Algebra: first, to train the pupil to methods of reasoning; second, to attain facility in methods of operation; third, to secure expertness in the use of algebraic formulas.

GEOMETRY.—Two terms are given to Geometry. In geometrical drawing, the student has already become familiar with geometrical forms and their construction. The first term is devoted to plane Geometry, in connection with technical drawing, involving the use of lines, angles and surfaces. During the second term, solid and spherical Geometry are studied. Practical problems, involving the principles demonstrated, are given to the class. Hand-books of engineering and of various arts are used for reference.

TRIGONOMETRY AND SURVEYING.—The principles of plane Trigonometry, involved in mensuration and surveying, are first mastered. Surveying includes theory, adjustment and use of instruments; history and methods of U. S. Government Surveys; areas of land; dividing land; retracing old lines; platting; topographical surveying; railroad surveying; leveling—section and cross section; computation of earth-work; field practice, with transit, compass, chain, level and rod; drawing and ornamentation of plans and profiles.

MECHANICS AND ENGINEERING.—A careful consideration of the laws of motion and force, as exhibited in all kinds of machines, and in various phenomena of nature, occupies a single term. Another term is given to proper study of materials for buildings, their construction and durability; forms of roofs and bridges; and care and use of machinery.

DRAWING.—This study is taught four terms, two of which are in the first, one in the second, and one in the third year. Students that show special aptitude in this direction are permitted to pursue the study during the remainder of the course.

First Term.—Definitions of lines and geometrical figures; judging lines and angles; construction of perpendiculars to given lines, intersecting and bisecting lines, triangles, four-sided figures and polygons, the circle and its secant lines, ellipses, and various geometrical ornaments. Prof. Walter Smith's four books on geometrical drawing are used as text-books.

Second Term.—Free-hand drawing.—After the study of numbers 3, 4 and 5 of Prof. Walter Smith's Text-books of Art Education, drawing from nature is taken up. Leaves, flowers and fruits are taken as subjects, and placed in such positions that the perspective will not interfere seriously with a correct perception of form. Each student is required to finish a set of drawings. Lectures on principles and ornamentation are given occasionally.

Third Term.—Projection of the straight line and the circle; use of drawing-board, T-square, and water colors; principles of shades and shadows; principles of parallel and angular perspective; principles of topographical drawing.

Fourth Term.—Projection of the conic sections and other regular curves; intersections of geometrical solids. Each student is required to draw and color a set of plans for a simple farm building, and another set of plans giving details of some farm machine.

ENGLISH LANGUAGE AND LITERATURE.—First Year.—The study of English Grammar is made to serve directly in clear perception and correct expression. Such practice in analysis and parsing as may give pupils a clear idea of the English sentence in all its parts, is associated with daily exercises in expression and criticism. A careful study of words and their elements,—roots, stems, prefixes and suffixes,—associating them with their origin and history, continues the course in English. Compound terms in formation and use, distinctions in synonyms, and associated meanings of words, are studied with care. Sentences are also analyzed with reference to their meaning, shades of thought, and propriety in expression. At the same time, the daily exercises are made a means of training in exact articulation, spelling, writing, and the essentials of good reading.

Principles and methods in English Composition are then taken up, with David J. Hill's Elements of Rhetoric for a text-book. Numerous exercises and revisions familiarize the students with the essentials of neat, legible, clear, and forcible manuscript.

Third Year.—A term's study of higher Rhetoric is occupied with the principles of clear explanation and convincing argument, as well as the outline of sound criticism. This is followed by a term spent in the history of English language and lit-

erature, with abundant illustrations from the best authors. Students are led in this way to appreciate the power of our mother-tongue, and at the same time to gain a slight acquaintance with the best thoughts of the world. Students are encouraged and directed in the use of the College Library, and are under constant oversight in the expression of their thoughts in writing. Original declamations, carefully prepared, and delivered before the students and Faculty, make a part of the drill in the higher classes.

HISTORY AND POLITICAL ECONOMY.—The elements of United States History occupy a term's study in the first year; and special attention is given to the form and growth of the government under which we live. In the fourth year, a careful study of the Constitution of the United States is made to show the general principles of government, its means and methods, illustrated by historical references. A single term is given to the study of general history in outline, with especial emphasis upon the world's progress in science, literature and art.

The study of political economy in a full term of the fourth year, gives a fair presentation of subjects connected with production, distribution and consumption of wealth. Pains is taken to compare conflicting views, and point out sources of information on all sides of vexed questions without bias or prejudice.

LOGIC AND PHILOSOPHY.—The art of reasoning correctly is aided by a study of systematic logic, both deductive and inductive. Special prominence is given to methods for exact observation and experiment, and correct principles of classification. The previous researches and experiences of the student are made to illustrate these principles.

A short course in Psychology gives the general principles of intellectual and moral philosophy. Perception, understanding, reason, feelings and volition, are topics of explanation and analysis. Theories of right and wrong, and correct principles of action, are made the basis of a clear understanding of individual rights and duties.

SPECIAL HYGIENE.—To the ladies of the fourth year, a course of daily lectures is given by the lady superintendent of the sewing-room, upon the laws of life and health. The course continues through the entire term, and covers questions pertaining to personal health and the health of the household, such as food, air, exercise, clothing, temperature of rooms, etc.

HOUSEHOLD ECONOMY.—A series of lectures, accompanied by practical illustrations in the kitchen laboratory, continues through a term and a half. These cover the general ground of economical provision for the household,—marketing, cooking, preserving, order, neatness and beauty in table service, comfort of family, and care of a sick-room. These are supplemented by the lectures upon Household Chemistry and Dairying.

INDUSTRIAL ARTS.—The training in these departments is designed to be systematic and complete in each, so that any student following a single line diligently through a four years' course, gains the essentials of a trade and reasonable skill. Those who wish only a general acquaintance with these arts, can take shorter courses in several of them; but all are to select with definite purpose. In the regular course for farmers, agriculture and horticulture both are required as industrials during definite periods connected with their studies; certain terms of practice in the carpenter shop are also essential to readiness upon the farm. These will be adjusted to each other as improved facilities and larger classes require.

Young ladies are required to give the necessary time for practice in the kitchen laboratory, and are expected to show some facility in the practice of the sewing room, though other industrials may occupy their course. Telegraphy and printing are open to the ladies, without fees.

In agriculture and horticulture, the practice is made to illustrate and emphasize the teaching, and covers essentially the same ground. Training in the other arts is as follows:—

Carpentry, etc.—All are enrolled as carpenters, and take the same first lessons in sawing, planing and dressing lumber, making mortises, tenons and joints, and in general use and care of tools. Later, one who chooses a trade is provided with work directly in the line chosen, while the farmers' course provides for general training a great variety of operations, rather for ingenuity than for skill. In the full course of a carpenter, special instructions are given in the whole range of work, from the framing to the stair-building. Students are allowed, after attaining sufficient skill, to work upon their own material, under the advice of the superintendent.

Printing.—Two courses are pursued in this art. In one the student is given a general view of the rise and progress of printing, of type-founding, stereotyping, electrotyping, and lithography. He is taught the implements or tools employed in typography, and how to use them; composition; imposition; principles and practice in plain and ornamental job work; presses and their workings; technical terms; and general duties of a first-class workman. The second course, the lessons of which alternate with those in the first, embraces instruction in spelling, capitalization, punctuation, proof-reading and correction; preparation of essays and criticisms on the same; and such other miscellaneous work as will make the student accurate and expert in language.

Telegraphy.—The course of training involves for beginners the characters that compose the alphabet, and combinations of these characters into words and sentences,—attention being paid to spelling and to short and precise expressions in messages,—abbreviations, signals, forms of messages, train orders, reports, etc. To the more advanced is given regular line business; as, press reports, messages, cypher messages, and orders in all forms used by prominent telegraph companies, together with the necessary book-keeping upon exact copies of the blanks in actual use. One day in each week is devoted to instruction in the use and management of lines, batteries, instruments, etc. The elementary principles of electricity, magnetism, and electro-magnetism, involved in telegraphy, are taught and illustrated by experiments. The more rapid modes of telegraphy, including duplex, quadruplex, and the telephone, are explained.

Sewing.—Young ladies are taught in all ordinary forms of sewing with needle and machine, and in cutting, fitting and trimming dresses and other garments. They may furnish materials and work for their own advantage during the hour of practice under the direction of the superintendent.